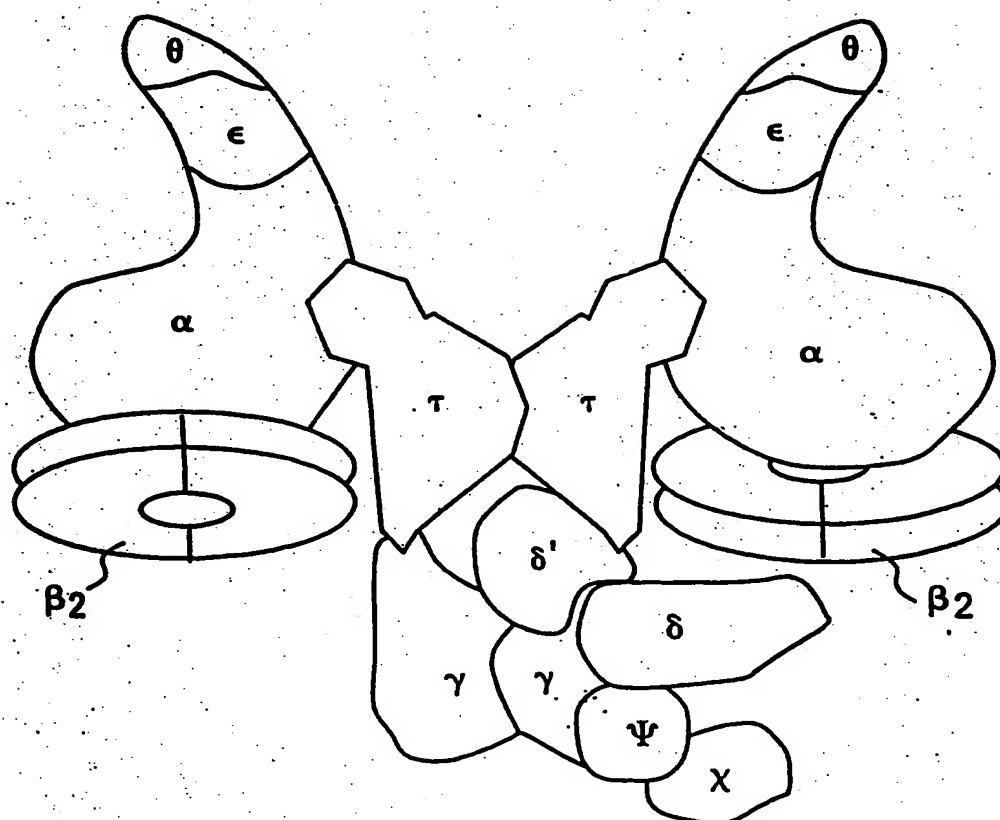


FIG.1



ATP binding

E. coli
MSYQVLARKWRPQTFADVGOEHVLTALANGLSLGRIHHAYLFSGTRGVGKTSIARLLAK
B. subtilis
MSYQALYRVFRPQRFEDVGOEHITKTLQNALQKKFSHAYLFSGPRGTGKTSAAKIFAK
*** *

E. coli
GLNCETGITATPCGVCDNCREIEQGRFVDLIEIDAASRTKVEDTRDLLDNVQYAPARGRF
B. subtilis
AVNCEHAPVDEPCNECAACKGITNGSISDVIEIDAASNNGVDEIRDVKVFAPSAVTY
*** *

E. coli
KVYLIDEVHMLSRHSFNALLKTLEEPPEHVKFLATTDPQKLPVTILSRCLQFHLKALDV
B. subtilis
KVYIIDEVHMLSIGAFNALLKTLEEPPEHCIFILATTEPHKIPLTIISRCQRFDFKRITS
*** *

FIG. 2

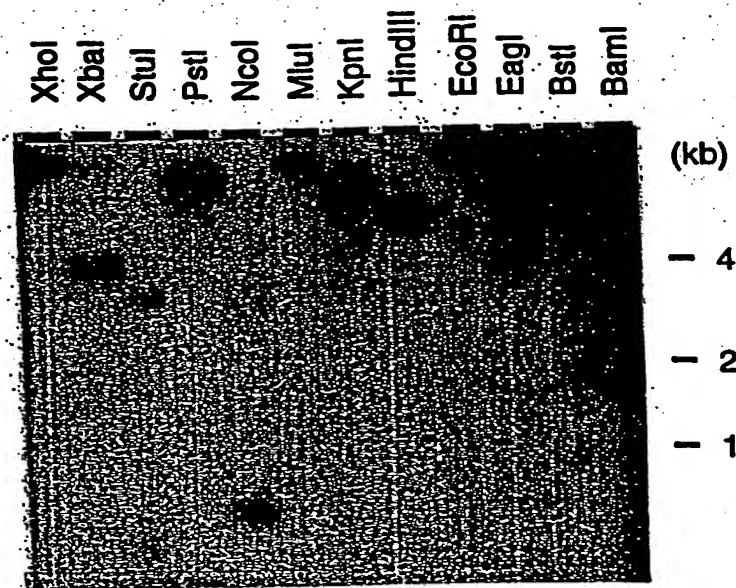


FIG.3

TCCGGGGGTG	GGGTTCACAG	GTAGACCCCG	GCCCCCTCCG	TGAGCCCCTT	TACCCAGGCC	60
GCCACCTCCT	CCAGGGGGC	CAAGCGGTGC	AAGGAGAGGA	ACGTCCGCAC	CAGGCCCTAT	120
					S.D.	
ACTAGCCTT	GTG AGC GCC CTC TAC CGC CGC TTC CGC CCC CTC ACC TTC CAG GAG GTG GTG					180
	met ser ala leu tyr arg arg phe arg pro leu thr phe gln glu val val					(17)
					CAC	
	GGG CAG GAG CAC GTG AAG GAG CCC CTC CTC AAG GCC ATC CGG GAG GGG AGG CTC GCC CAG					240
	gly gln glu his val lys glu pro leu leu lys ala ile arg glu arg leu ala gln					(37)
	GCS TAC CTS TTC TCC GGS AC					
	GCC TAC CTC TTC TCC GGG CCC AGG GGC GTG GGC AAG ACC ACC ACG GCG AGG CTC CTC GCC					300
	ala tyr leu phe ser gly pro arg gly val gly lys thr thr ala arg leu leu ala					(57)
	ATG GCG GTG GGG TGC CAG GGG GAA GAC CCC CCT TGC GGG GTC TGC CCC CAC TGC CAG GCG					360
	met ala val gly cys gln gly glu asp pro pro cys gly val cys pro his cys gln ala					(77)
	GtG CAG AGG GGC GCC CAC CCG GAC GTG GTG GAC ATT GAC GCC GCG AGC AAC AAC TCC GTG					420
	val gln arg gly ala his pro asp val val asp ile asp ala ala ser asn ser val					(97)
	GAG GAC GTG CGG GAG CTG AGG GAA AGG ATC CAC CTC GCC CCC CTC TCT GCC CCC AGG AAG					480
	glu asp val arg glu leu arg glu arg ile his leu ala pro leu ser ala pro arg lys					(117)
					C	
	GTC TTC ATC CTG GAC GAG GCC CAC ATG CTC TCC AAA AGC GCC TTC AAC GCC CTC CTC AAG					540
	val phe ile leu asp Glu ala his met leu ser lys ser ala phe asn ala leu leu lys					(137)

FIG.4A-1

GAG CGC CTC GCC CGC CGC TCC GAC GCC TTA AGC CTG GAG GTG GCC CTC CTG GAG GCG GGA	1140
glu arg leu ala arg arg ser asp ala leu ser leu glu val ala leu glu ala gly	(337)
AGG GCC CTG GCC GAG GCC CTA CCC CAG CCC ACC GGC GCT CCT TCC CCA GAG GTC GGC	1200
arg ala leu ala ala glu ala leu pro gln pro thr gly ala pro ser pro glu val gly	(357)
CCC AAG CCG GAA AGC CCC CCG ACC CCG GAA CCC CCA AGG CCC GAG GAG GCG CCC GAC CTG	1260
pro lys pro glu ser pro thr pro pro glu pro arg pro glu ala pro asp leu	(377)
CGG GAG CGG TGG CGG GCC TTC CTC GAG GCC CTC AGG CCC ACC CTA CGG GCC TTC GTG CGG	1320
arg glu arg trp arg ala phe leu glu ala leu arg pro thr leu arg ala phe val arg	(397)
GAG GCC CGC CCG GAG GTC CCG GAA GGC CAG CTC TGC CTC GCT TTC CCC GAG GAC AAG GCC	1380
glu ala arg pro glu val arg glu gly gln leu cys leu ala phe pro glu asp lys ala	(417)
TTC CAC TAC CGC AAG GCC TCG GAA CAG AAG GTG AGG CTC CTC CCC CTG GCC CAG GCC CAT	1440
phe his tyr arg lys ala ser glu gln lys val arg leu pro leu ala gln ala his	(437)
frameshift site	
TTC GGG GTG GAG GAG GTC GTC CTC GAG GGA GAA AAA AGC CTG AGC CCA AGG	1500
phe gly val glu glu val leu val leu glu gly glu lys ser leu ser pro arg	(457)

FIG.4B-1

CCC CGC CCG GCC CCA CCT CCT GAA GCG CCC GCA CCC CCG GGC CCT CCC GAG GAG GAG GTA	1560
pro arg pro ala pro pro pro glu ala pro ala pro pro gly pro pro glu glu val	(477)
GAG GCG GAG GAA GCG GCG GAG GAG GCG CCG GAG GAG GCC TTG AGG CCG GTG GTC CGC CTC	1620
glu ala glu ala ala glu ala pro glu ala leu arg arg val val arg leu	(497)
CTG GGG GGG CCG GTG CTC TGG GTG CCG CCG CCG ACC AGG ACC CCG GAG GCG CCG GAG GAG GAA	1680
leu gly gly arg val leu trip val arg arg pro arg thr arg glu ala pro glu glu	(517)
CCC CTG AGC CAA GAC GAG ATA GGG GGT ACT GGT ATA TAA	1740
pro leu ser gln asp glu ile gly thr gly ile *	(529)
CGACCTCGGA CAAGAGACCG TGGACAACAT CCTCAAGCGC CTCCGCCGTA TTGAGGGCCA	1820
GGTGCGGGGG CTCCAGAAGA TGGTGGCCGA GGGCCGCCCC TGCGACGAGG TCCTCACCCA	1880
GATGACCGCC ACCAAGAAG CCATGGAGGC GCGGCCACC CTGATCCTCC ACGAGTTCCT	1940
GAACGTCTGC GCCGCCGAGG TCCTCCGAGG CAAGGTGAAC CCGAGGAGAT	2000
CGCCACCATG CTGAAGAACT TCATCTA	2027

FIG.4B-2

Met	ser	ala	leu	tyr	arg	arg	pro	leu	thr	phe	gln	glu	val	gly	gln	glu	20			
his	val	lys	glu	pro	lys	ala	ile	arg	glu	gly	arg	leu	ala	gln	ala	tyr	leu	40		
phe	ser	gly	pro	arg	gly	val	lys	thr	thr	ala	arg	leu	ala	met	ala	val	60			
gly	cys	gln	gly	glu	asp	pro	cys	gly	val	cys	pro	his	cys	gln	ala	val	gln	arg	80	
gly	ala	his	pro	asp	val	val	ile	asp	ala	ala	ser	asn	ser	val	glu	asp	val	100		
arg	glu	leu	arg	glu	arg	ile	his	leu	ala	pro	leu	ser	ala	pro	arg	lys	val	phe	ile	120
leu	asp	glu	ala	his	met	leu	ser	lys	ala	phe	asn	ala	leu	leu	lys	thr	leu	glu	140	
glu	pro	pro	pro	his	val	leu	phe	ala	thr	thr	glu	pro	glu	arg	met	pro	pro	160		
thr	ile	leu	ser	arg	thr	thr	gln	his	phe	arg	arg	leu	thr	glu	glu	ile	ala	180		
phe	lys	leu	arg	arg	ile	leu	leu	glu	glu	arg	glu	ala	glu	glu	ala	leu	leu	200		
leu	leu	ala	arg	leu	ala	asp	ala	leu	arg	asp	ala	glu	ser	leu	leu	glu	arg	phe	220	
leu	thr	gly	val	ala	glu	pro	leu	lys	glu	val	glu	arg	ala	leu	gly	ser	pro	pro	240	
gly	leu	ala	arg	arg	leu	tyr	gly	glu	ala	pro	arg	ser	leu	val	ser	gly	leu	280		
leu	glu	val	phe	arg	glu	gly	leu	tyr	ala	phe	gly	leu	ala	gly	thr	pro	leu	pro	300	
ala	pro	pro	gln	ala	leu	ile	ala	met	thr	ala	leu	asp	glu	ala	met	glu	arg	leu	320	
ala	arg	ser	asp	ala	leu	ser	leu	glu	val	ala	leu	leu	glu	ala	gly	arg	ala	leu	340	
ala	ala	glu	ala	leu	pro	gln	pro	thr	gly	ala	pro	ser	pro	glu	val	gly	pro	lys	pro	360
glu	ser	pro	pro	thr	pro	glu	pro	pro	glu	glu	ala	pro	asp	leu	arg	glu	arg	380		
trp	arg	ala	phe	leu	glu	ala	leu	ala	leu	arg	ala	phe	val	arg	glu	ala	arg	400		
pro	glu	val	arg	glu	gly	gln	lys	val	arg	leu	pro	leu	ala	gln	ala	his	phe	tyr	420	
arg	lys	ala	ser	glu	gln	lys	val	arg	leu	pro	leu	ala	gln	ala	his	phe	gly	val	440	
glu	glu	val	val	leu	val	leu	glu	gly	lys	ser	leu	ser	pro	arg	pro	arg	pro	460		
ala	pro	pro	pro	glu	ala	pro	pro	gly	pro	pro	glu	glu	glu	val	glu	ala	glu	480		
glu	ala	ala	glu	glu	ala	pro	glu	glu	ala	leu	arg	val	val	arg	leu	leu	gly	gly	500	
arg	val	leu	trp	val	arg	arg	thr	arg	glu	ala	pro	glu	glu	glu	pro	leu	ser	520		
gln	asp	glu	ile	gly	thr	gly	ile											529		

FIG.4D

Met	ser	ala	leu	tyr	arg	arg	phe	arg	pro	leu	thr	phe	gln	glu	val	gly	gln	glu	20	
his	val	lys	glu	pro	leu	lys	ala	ile	arg	glu	thr	gln	arg	leu	ala	gln	ala	tyr	leu	40
phe	ser	gly	pro	arg	gly	val	gly	lys	thr	thr	thr	ala	arg	leu	leu	ala	met	ala	val	60
gly	cys	gln	gly	glu	asp	pro	pro	cys	gly	val	cys	pro	his	cys	gln	ala	val	gln	arg	80
gly	ala	his	pro	asp	val	val	asp	ile	asp	ala	ala	ser	asn	asn	ser	val	glu	asp	val	100
arg	glu	leu	arg	glu	arg	ile	his	leu	ala	pro	leu	ser	ala	pro	arg	lys	val	phe	ile	120
leu	asp	glu	ala	his	met	leu	ser	lys	ser	ala	phe	asn	ala	leu	leu	lys	thr	leu	glu	140
glu	pro	pro	pro	his	val	leu	phe	val	phe	ala	thr	thr	glu	pro	glu	arg	met	pro	pro	160
thr	ile	leu	ser	arg	thr	gln	his	phe	arg	phe	arg	arg	leu	thr	glu	glu	glu	ile	ala	180
phe	lys	leu	arg	arg	ile	leu	glu	ala	val	gly	arg	glu	ala	glu	glu	glu	ala	leu	leu	200
leu	leu	ala	arg	leu	ala	asp	gly	ala	leu	arg	asp	ala	glu	ser	leu	leu	glu	arg	phe	220
leu	thr	leu	glu	gly	pro	leu	pro	leu	lys	glu	val	glu	arg	ala	leu	gly	ser	pro	pro	240
gly	thr	gly	val	ala	arg	leu	ala	ala	ser	leu	ala	arg	gly	lys	thr	ala	glu	ala	leu	260
gly	leu	ala	arg	arg	leu	tyr	gly	gly	glu	tyr	ala	pro	arg	ser	leu	val	ser	gly	leu	280
leu	glu	val	phe	arg	glu	glu	leu	gly	ala	ala	phe	gly	leu	ala	gly	thr	pro	leu	pro	300
ala	pro	pro	gln	ala	ala	leu	ile	ala	met	thr	ala	leu	asp	glu	ala	met	glu	arg	leu	320
ala	arg	arg	ser	asp	ala	leu	ser	leu	glu	val	ala	leu	leu	glu	ala	gly	arg	ala	leu	340
ala	ala	glu	ala	leu	pro	pro	gln	pro	thr	gly	ala	pro	ser	pro	glu	val	gly	pro	lys	360
glu	ser	pro	pro	thr	pro	pro	glu	pro	pro	arg	glu	ala	ala	pro	asp	leu	arg	glu	arg	380
trp	arg	ala	phe	leu	glu	ala	leu	ala	arg	pro	thr	leu	arg	phe	val	arg	glu	ala	arg	400
pro	glu	val	arg	glu	gly	gln	leu	leu	cys	leu	ala	phe	pro	glu	asp	lys	ala	phe	his	420
arg	lys	ala	ser	glu	glu	gln	lys	val	arg	leu	leu	pro	leu	ala	gln	ala	his	phe	gly	440
glu	glu	val	val	leu	val	leu	glu	glu	lys	lys	lys	pro	lys	pro	asp	pro	lys	ala	pro	460
gly	pro	thr	ser																	464

FIG.4E

Met ser ala leu tyr arg phe arg pro leu thr phe gln glu val gln glu 20
 his val lys glu pro leu lys ala ile arg glu gly arg leu ala gln ala tyr leu 40
 phe ser gly pro arg gly val lys thr thr thr ala arg leu ala met ala val 60
 gly cys gln gly glu asp pro pro cys gly val cys pro his cys gln ala val gln arg 80
 gly ala his pro asp val val asp ile asp ala ala ser asn ser val glu asp val 100
 arg glu leu arg glu arg ile his leu ala pro leu ser ala pro arg lys val phe ile 120
 leu asp glu ala ala his met leu ser lys ser ala phe thr glu pro glu arg met pro pro 140
 glu pro pro pro his val leu phe val phe ala thr thr glu pro glu arg met pro pro 160
 thr ile leu ser arg thr thr gln his phe arg phe arg leu thr glu glu ile ala 180
 phe lys leu arg arg ile leu glu ala val gly arg glu ala glu glu ala leu leu 200
 leu leu ala arg leu ala asp gly ala leu arg asp ala glu ser leu leu arg phe 220
 leu leu leu glu gly pro leu thr arg lys glu val glu arg ala leu gly ser pro pro 240
 gly thr gly val ala glu ile ala ala ser leu ala arg gly lys thr ala glu ala leu 260
 gly leu ala arg arg leu tyr gly glu gly tyr ala pro arg ser leu val ser gly leu 280
 leu glu val phe arg glu gly leu tyr ala ala phe gly leu ala gly thr pro leu pro 300
 ala pro pro gln ala leu ile ala ala met thr ala leu asp glu ala met glu arg leu 320
 ala arg arg ser asp ala leu pro gln pro thr gly ala pro ser pro glu val gly pro 340
 ala ala glu ala leu pro pro glu pro thr pro arg pro glu ala phe val arg glu arg 360
 glu ser pro pro thr leu glu ala leu arg pro thr leu arg phe val arg glu arg 380
 trp arg ala phe leu glu gln leu cys leu ala phe pro glu asp lys ala arg 400
 pro glu val arg glu gly gln lys val arg leu leu pro leu ala gln ala his phe tyr 420
 arg lys ala ser glu gln lys val arg leu leu pro leu ala gln ala his phe gly val 440
 glu glu val val leu glu gly glu lys lys lys ala 454

FIG.4F

		ATP site	
E.coli	MSYQVLARKWRPQTFADVVGQEHVLTALANGLSLGRHHAYLFSGTRGVGKTSIARLLAK	60	
H.inf.K.....II.....KDN.L.....F.....	60	
B.sub.A.Y.VF...R.E.....ITKT.Q.A.LQKKFS.....P.T....A.KIF..	60	
C.cres.	DA.T.....Y.R..E.LI...AMVRT...AF.T...A..FMLT.V.....TT.....R	113	
M.gen.	-MH..FYQ.Y..IN.KQTL...SIRKI.V.AINRDKLPNG.I...E..T...TF.KII..	59	
T.th.	--VSA.Y.RF..L..QE.....KEP.LKAIRE..LAQ.....P.....TT.....M	58	

	Zn ⁺⁺ finger	
E.coli	GLNCET----	116
H.inf.	...VH----V.....E.E.KA....N.I.....E.....K.V	116
B.sub.	AV...H----APVDE..NE.AA.KG.TN.SIS.V.....NNG.DEI..IR.K.KF..S	116
C.cres.	A..Y..DTVK.PSVDLTTEGYH..S.IE..HM.VL.L.....DEM.E...G.R...V	173
M.gen.	AI..LN----WDQIDV.NS..V.KS.NTNSAI.IV.....KNGIN.I.E.VE..FNH.F	115
T.th.	AVG.QG-----EDP.....PH.QAVQR.AHP.VVD.....NNS...V.E.RERIHL..L	112

E.coli	RGRFKVYLIDEVHMLSRHSFNALLKLTLEPPPEHVKFLLATDPQKLPVTILSRCLQFHLK	176
H.inf.	V.....Y.....	176
B.sub.	AVTY...I.....IGA.....CI.I....E.H.I.L.I...QR.DF..	176
C.cres.	EA.Y...I.....TAA.....P.A..IF...EIR.V.....QR.D.R	233
M.gen.	TFKK...IL..A...TTQ.WGG.....S.PY.L.IFT..EFN.I.L.....QS.FF..	175
T.th.	SAPR..FIL..A....KSA.....P..L.VF...E.ERM.P.....TQH.RFR	172

FIG.5A

E.coli	ALDVEQIRHQLEHILNEEHIAHEPRALQLLARAAEGSLRDALSLTDQAIASGDQ--VST	234
H.inf.	...ET...SQH.A...TQ.N.PF.DP..VK..K..Q..I..S.....M..R.--.TN	234
B.sub.	RITSQA.VGRMNK.VDA.QLQV.EGS.EII.S..H.GM.....L.....SFSGDI--LKV	234
C.cres.	RVEPDVLVKHEDR.SAK.GARI.MD..A.I.....V..G...L.....VQTERGQT.TS	293
M.gen.	KITSDL.LER.ND.AKK.K.KI.KD..IKI.DLSQ.....G...L...LAI.LIVKKL.LL	235
T.th.	R.TE.E.AFK.RR..EAVGREA.EE..L....L.D.A....E..LERFLLLEGP---LTR	229
E.coli	QAVSAMLGTLDDQALSLEAMVEANGERMALINEAAARGIEWEALLVEMLGLLHRIAM	294
H.inf.	NV..N...L...NYSVDILY.LHQG...LL.RTLQRV.DAAGD.DK..G.CAEK..Q..L	294
B.sub.	EDALLIT.AVSQLYIGK.AKSLHDK.VSDALETL..LLQQ.KDPAK.IED.IFYFRDMLL	294
C.cres.	TV.RD...LA.RS.TIA.Y.HVMAGKTKDALEGFRALWGF.ADPVVMLDV.DHC.AS.V	353
M.gen.	MLKKHLISLIEMQN.L.KQFYQ.I	260
T.th.	KE.ERA..SPPGTGVAEIAASLARGKTAELG.ARRLYGE.YAPRS.VSGL.EVFREGLY	289

FIG.5B

1. The first step is to identify the problem.
 2. The second step is to define the problem.
 3. The third step is to analyze the problem.
 4. The fourth step is to develop a solution.
 5. The fifth step is to implement the solution.
 6. The sixth step is to evaluate the solution.
 7. The seventh step is to monitor the solution.
 8. The eighth step is to maintain the solution.
 9. The ninth step is to improve the solution.
 10. The tenth step is to document the solution.

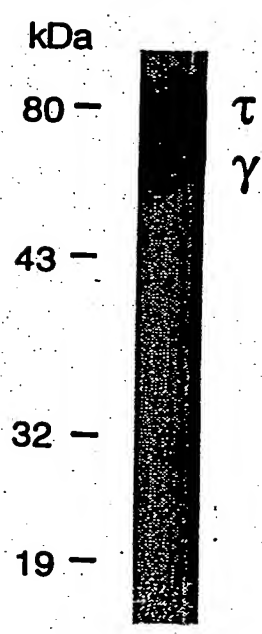
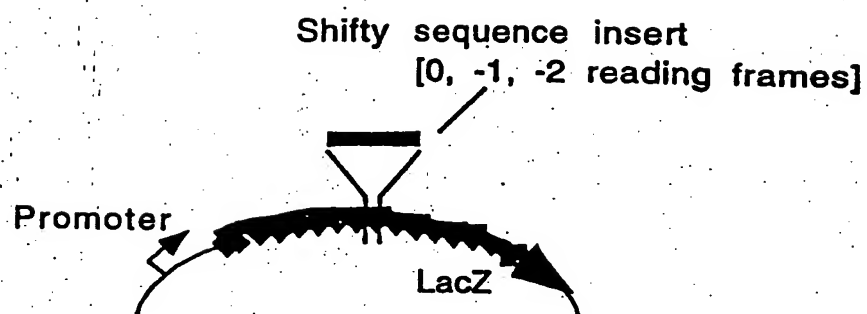


FIG.7

FIG.8A



	Reading frame	Blue	White
Shifty sequence	0	+	
	- 1	+	
	- 2	+	
Mutant sequence	0	++	
	- 1		+
	- 2		+

FIG.8B

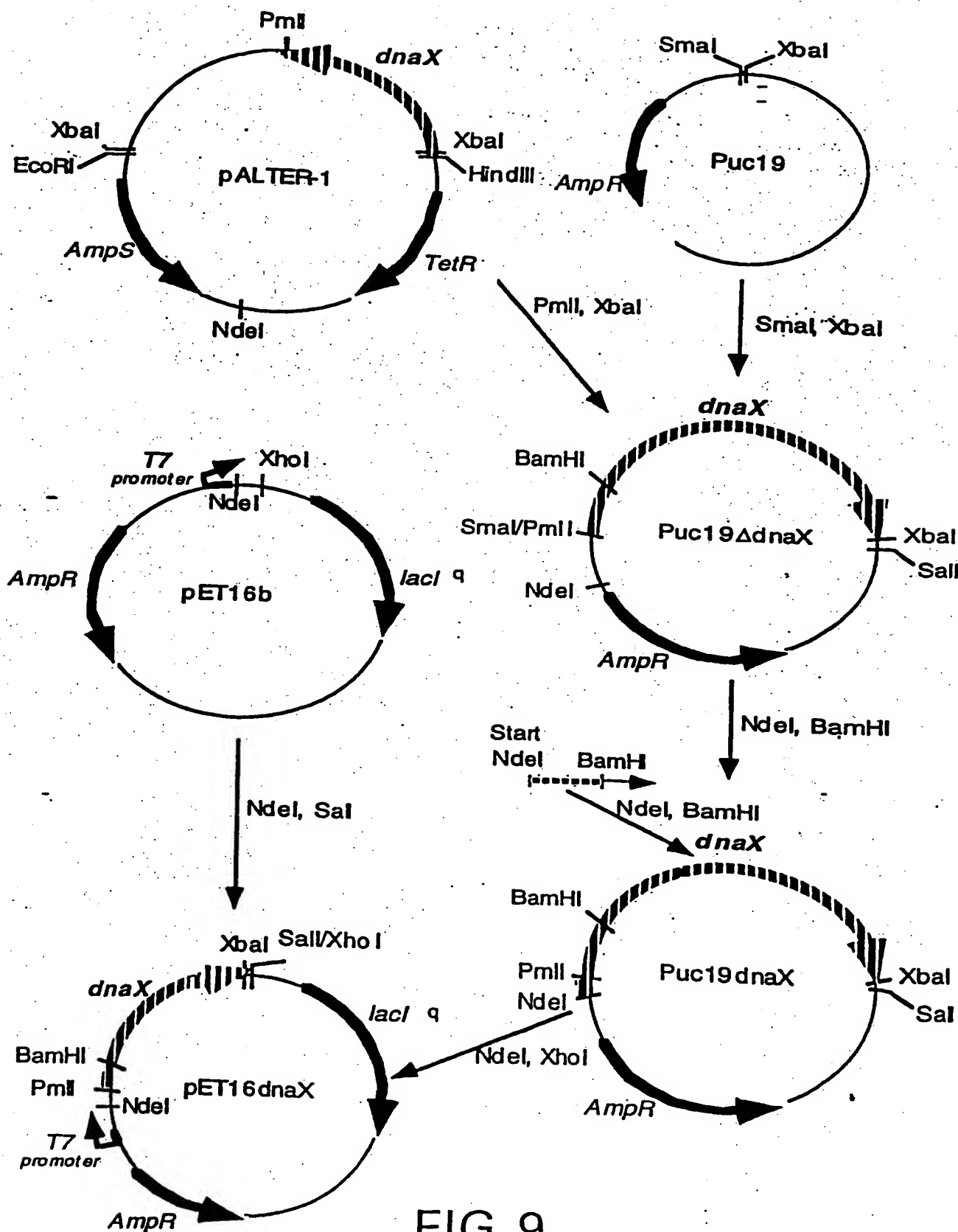


FIG.9

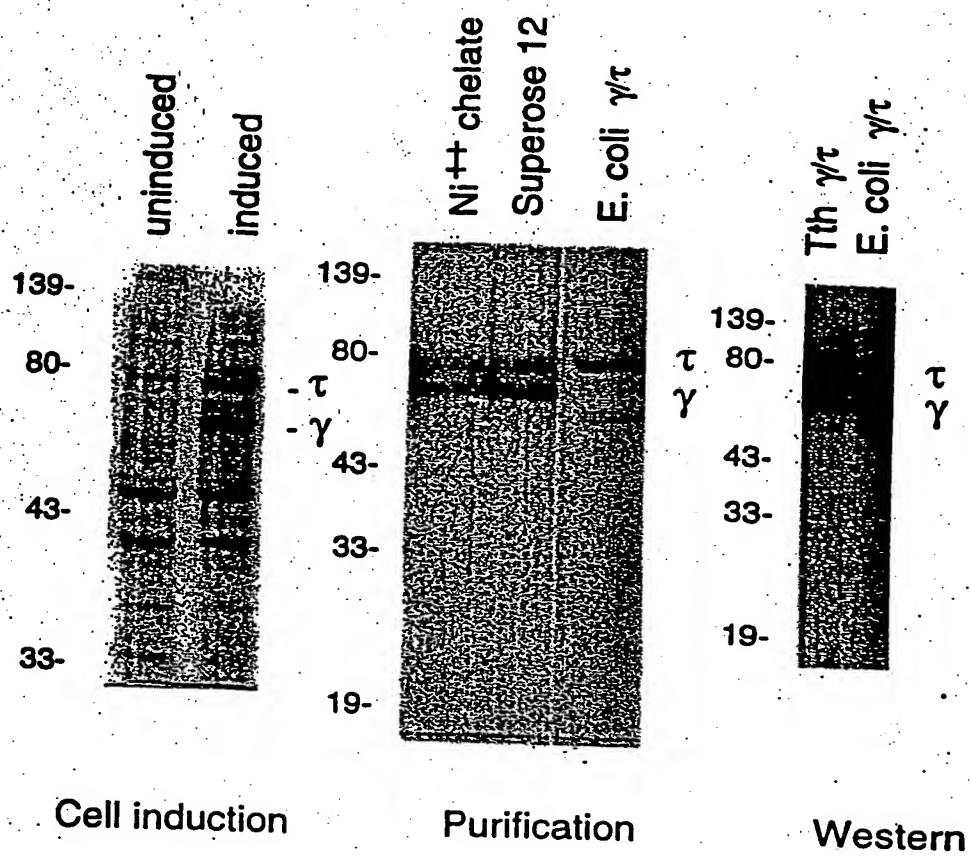


FIG. 10A FIG. 10B FIG. 10C

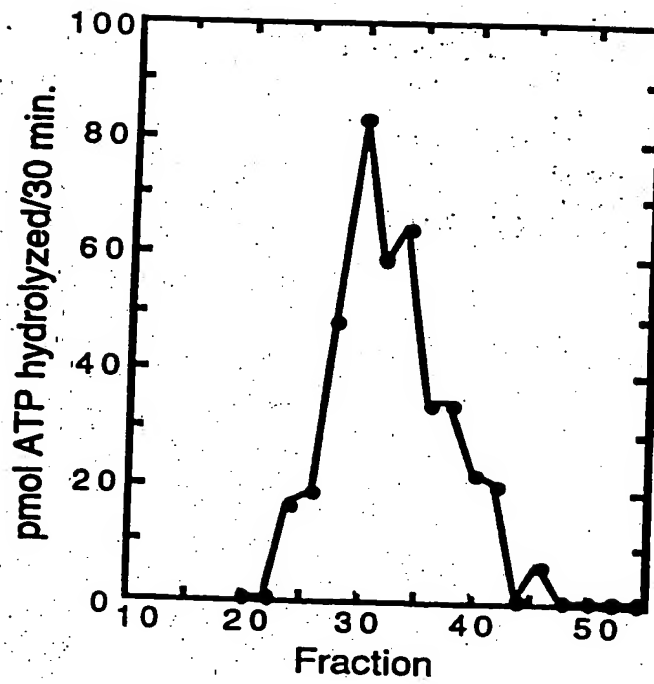


FIG.11A

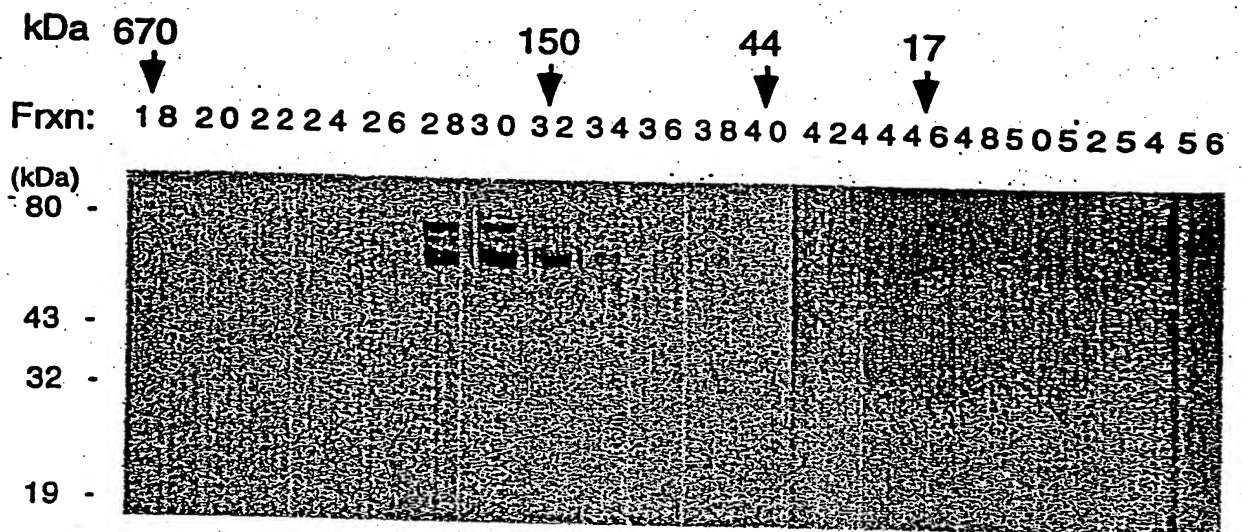


FIG.11B

FIG.12A

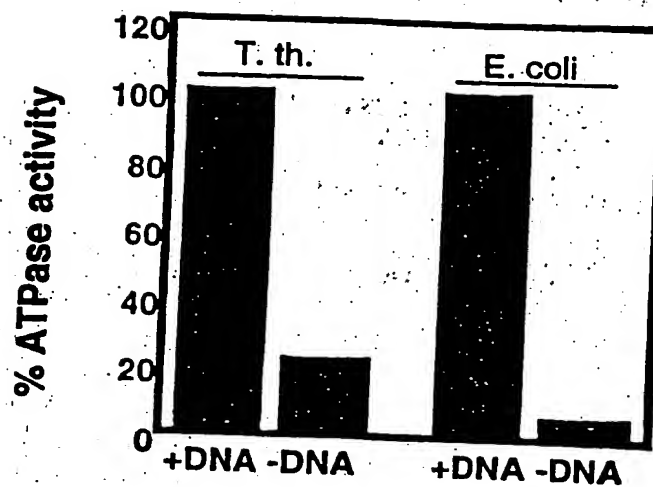


FIG.12B

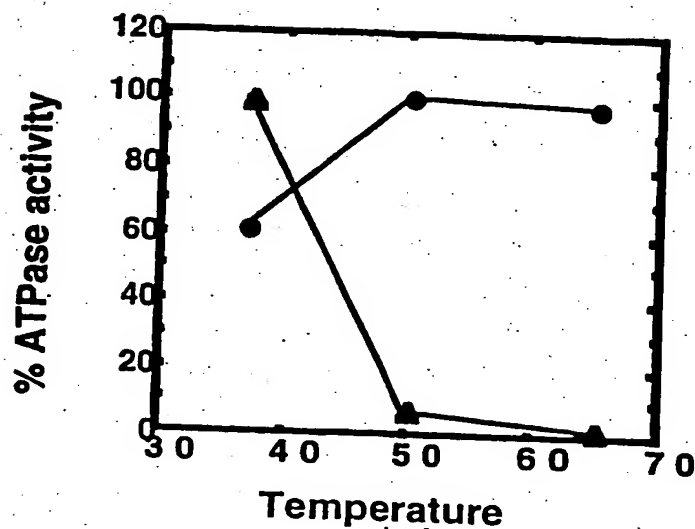


FIG.12C

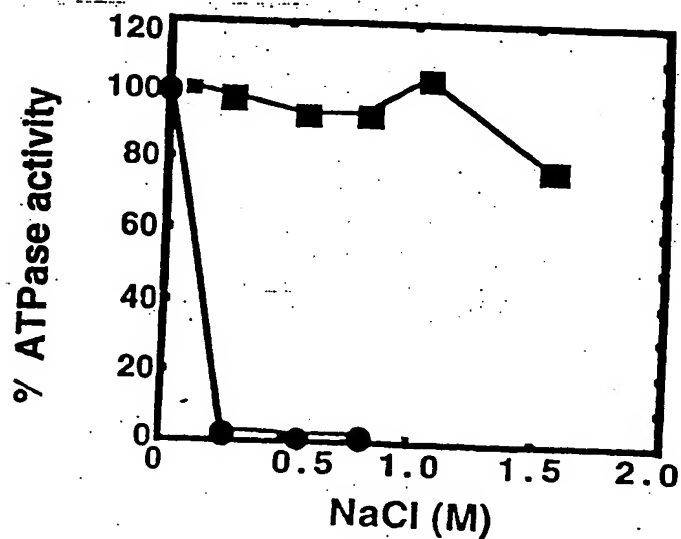


FIG.13A

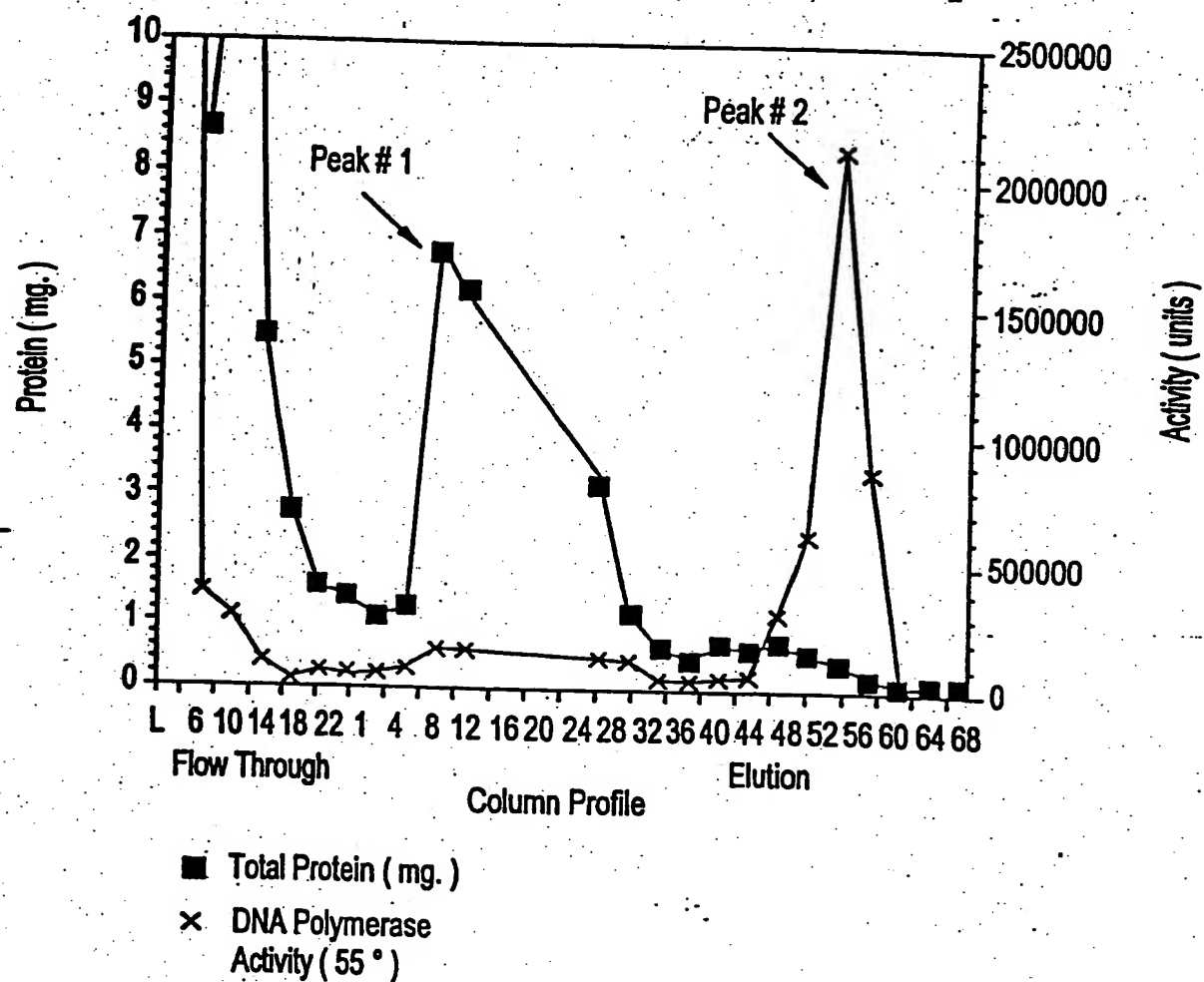


FIG.13B

ATP Agarose Step Column

FIG.13C

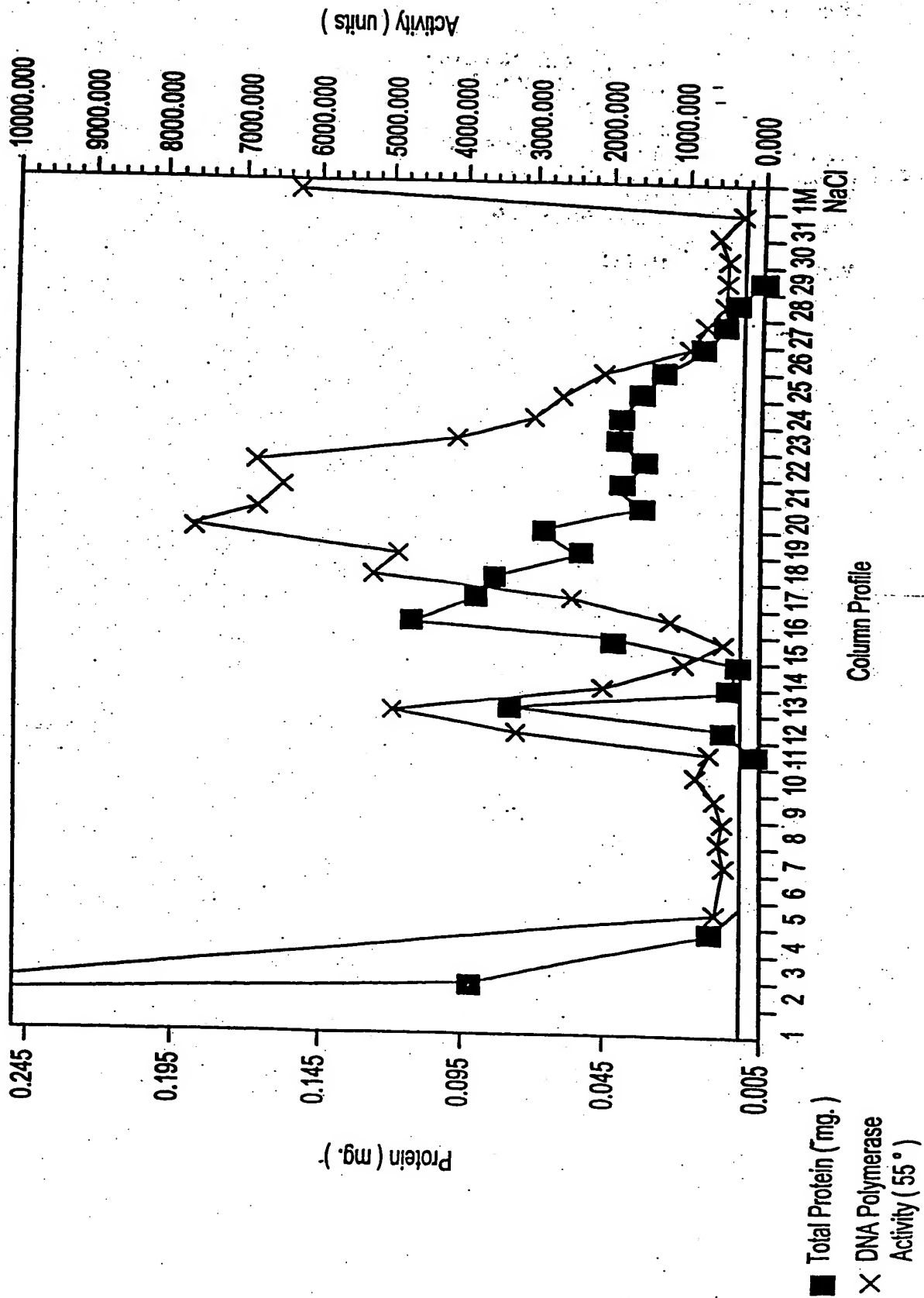
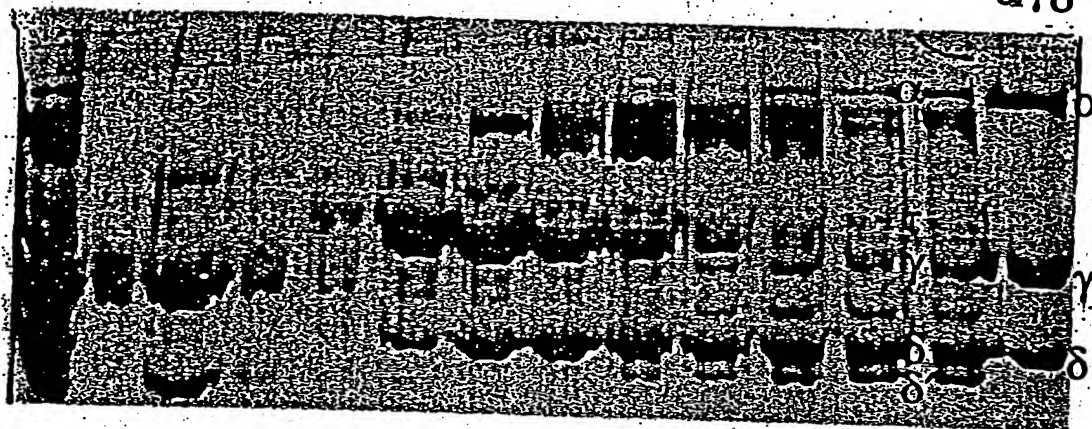


FIG.14A

load FT 9 10 11 12 13 14 15 16 17 18 19 E. coli α γ δ



↑ ↑
T.th subunits E. coli subunits

FIG.14B

load FT 9 10 11 12 13 14 15 16 17 18 19



← α

Alignment of TTH1 with alphas subunits of other organisms.

E.coli	DRYFLELIRTPDEESYLHAAVELAEARGLPV	197	(ID#72)
V.chol.	DHFYLELIRTPGRADEESYLHFALDVAEQYDLPV	197	(ID#73)
H.inf.	DHFYALSRTPNEERYIQALKLAERCDPLV	197	(ID#74)
R.prow.	DRFYFEIMRHDLPPEEQFIENSYIQIASELSIPV	195	(ID#75)
H.pyl.	DDFYLEIMRHGILDQRFIDEQVIKMSLETGLKII	213	(ID#76)
S.sp.	DDYYLEIQDHGSVEDRLVNINLVKIAQELDIKIV	202	(ID#77)
M.tub.	DNYFLELMDHGLTIERRVRDGLLEIGRALNIPPL	220	(ID#78)
T.th.	FFIEIQNHGLSEQK		(ID#61)

FIG.15A

Alignment of TTH2 with alphas subunits of other organisms.

E.coli	NKRRAKNGEPPLDIAAIPLDDKKSFDMQRSETTAVFQLESRGMKD	618	(ID#79)
V.chol.	NPRLKKAGKPPVRIEAIPLDDARSFRNLQDAKTTAVFQLESRGMK	618	(ID#80)
H.inf.	NVRMVRGKPRVDIAAIPLDDPESFELLKRSETTAVFQLESRGMKD	618	(ID#81)
R.prow.	CKKLLKEQGIKIDFDDMTFDDKKTYQMLCKGKGVGFQFESIGMKD	624	(ID#82)
H.pyl.	LKIIKTQHKISVDFLSLMDDDPKVYKTIQSGDTVGFQIES-GMFQ	648	(ID#83)
S.sp.	QERKALQIRARTGSKKLPPDDVKKTHKLLLEAGDLEGIFQLESQGMKQ	643	(ID#84)
M.tub.	IDNVRANRGIDLDESVPFLDDKATYELLGRGDTLGVFQLDGGPMRD	646	(ID#85)
T.th.	RVELDYDALTLDD		(ID#60)

FIG.15B

ATGGGCCGGGAGCTCCGCTTCGCCACCTCCACCAGCACA	
CCCAGTTCTCCCTCCTGGACGGGGCGGCGAAGCTTTCCGA	
CCTCCTCAAGTGGGTCAAGGAGACGACCCCGAGGACCC	120
GCCTTGGCCATGACCGACCACGGCAACCTCTTCGGGGCCG	
TGGAGTTCTACAAGAAGGCCACCGAAATGGGCATCAAGCC	
CATCCTGGGCTACGAGGCCTACGTGGCGGCGGAAAGCCGC	240
TTTGACCGCAAGCGGGGAAAGGGCCTAGACGGGGGCTACT	
TTACCTCACCTCCTCGCCAAGGACTTCACGGGGTACCA	
GAACCTGGTGCCTGGCGAGCCGGGCTTACCTGGAGGGG	360
TTTTACGAAAAGCCCCGATTGACCGGGAGATCCTGCGCG	
AGCACGCCGAGGGCCTCATCGCCCTCTCGGGGTGCCTCGG	
GGCGGAGATCCCCAGTTCATCCTCCAGGACCGTCTGGAC	480
CTGGCCGAGGCCCGCTCAACGAGTACCTCTCCATCTTCA	
AGGACCGCTTCTTCATCGAGATCCAGAACCACGGCCTCCC	
CGAGCAGAAAAAGGTCAACGAGGTCTCAAGGAGTTCGCC	600
CGAAAGTACGGCCTGGGGATGGTGGCCACCAACGACGGCC	
ATTACGTGAGGAAGGAGGACGCCCCGCGCCACGAGGTCCT	
CCTCGCCATCCAGTCCAAGAGCACCTGGACGACCCCGGG	720
CGCTGGCGCTTCCCCTGCGACGAGTTCTACGTGAAGACCC	
CCGAGGAGATGCGGGCCATGTTCCCGAGGAGGAGTGGGG	
GGACGAGCCCTTTGACAACACCGTGGAGATCGCCCGCATG	840
TGCAACGTGGAGCTGCCCATCGGGGACAAGATGGTCTACC	
GAATCCCCCGCTTCCCCCTCCCCGAGGGGCGGACCGAGGC	
CCAGTACCTCATGGAGCTCACCTTCAAGGGGCTCCTCCGC	960
CGCTACCCGGACCGGATCACCGAGGGCTTCTACCGGGAGG	
TCTTCCGCCTTTTGGGGAAGCTTCCCCCCCACGGGGACGG	
GGAGGCCTTGGCCGAGGCCTTGGCCAGGTGGAGCGGGAG	1080
GCTTGGGAGAGGCTCATGAAGAGCCTCCCCCTTTGGCCG	
GGGTCAAGGAGTGGACGGCGGAGGCCATTTTCCACCGGGC	
CCTTTACGAGCTTTCGTGATAGAGCGCATGGGGTTTCCC	1200
GGCTACTTCTCATCGTCCAGGACTACATCAACTGGGCCC	
GGAGAAACGGCGTCTCCGTGGGGCCCCGGCAGGGGGAGCGC	
CGCCGGGAGCCTGGTGGCCTACGCCGTGGGGATCACCAAC	1320
ATTGACCCCCCTCCGCTTCGGCCTCCTCTTTGAGCGCTTCC	
TGAACCCGGAGAGGGTCTCCATGCCCGACATTGACACGGA	
CTTCTCCGACCGGGAGCGGGACCGGGTGATCCAGTACGTG	1440
CGGGAGCGCTACGGCGAGGACAAGGTGGCCAGATCGGCA	
CCCTGGGAAGCCTCGCCTCCAAGGCCGCCCTCAAGGACGT	
GGCCCGGGTCTACGGCATCCCCACAAGAAGGCGGAGGAA	1560
TTGGCCAAGCTCATCCCGGTGCAGTTCGGGAAGCCCAAGC	
CCCTGCAGGAGGCCATCCAGGTGGTGGCGGAGCTTAGGGC	
GGAGATGGAGAAGGACCCCAAGGTGCGGGAGGTCTCTGAG	1680
GTGGCCATGCGCCTGGAGGGCCTGAACCGCCACGCCTCCG	
TCCACGCCGCCGGGGTGGTGATCGCCGCCGAGCCCTCAC	
GGACCTCGTCCCCCTCATGCGCGACCAGGAAGGGCGGCCC	1800
GTCACCCAGTACGACATGGGGGCGGTGGAGGCCTTGGGGC	
TTTTGAAGATGGACTTTTTGGGCCTCCGCACCCTCACCTT	

FIG. 16A

CCTGGACGAGGTCAAGCGCATCGTCAAGGCGTCCCAGGGG
 GTGGAGCTGGACTACGATGCCCTCCCCCTGGACGACCCCA
 AGACCTTCGCCCTCCTCTCCCGGGGGGAGACCAAGGGGGT
 CTTCCAGCTGGAGTCGGGGGGGATGACCGCCACGCTCCGC
 GGCTCAAGCCGCGGCGCTTTGAGGACCTGATCGCCATCC
 TCTCCCTCTACCGCCCCGGGCCCATGGAGCACATCCCCAC
 CTACATCCGCGGCCACCACGGGCTGGAGCCCGTGAGCTAC
 AGCGAGTTTCCCCACGCCGAGAAGTACCTAAAGCCCATCC
 TGGACGAGACCTACGGCATCCCCGTCTACCAGGAGCAGAT
 CATGCAGATCGCCTCGGCCGTGGCGGGGTACTCCCTGGGC
 GAGGCGGACCTCCTGCGGCGGTCCATGGGCAAGAAGAAGG
 TGGAGGAGATGAAGTCCACCGGGAGCGCTTCGTCCAGGG
 GGCAAGGAAAGGGGCGTGCCCGAGGAGGAGGCCAACCGC
 CTCTTTGACATGCTGGAGGCCTTCGCCAACTACGGCTTCA
 ACAAATCCCACGCTGCCGCCTACAGCCTCCTCTCCTACCA
 GACCGCCTACGTGAAGGCCCACTACCCCGTGAGTTTATG
 GCCGCCCTCCTCTCCGTGGAGCGGCACGACTCCGACAAGG
 TGGCCGAGTACATCCGCGACGCCCGGGCCATGGGCATAGA
 GGTCTTCCCCCGGACGTCAACCGCTCCGGGTTTGACTTC
 CTGGTCCAGGGCCGCGAGATCCTTTTCGGCCTCTCCGCGG
 TGAAGAACGTGGGCGAGGCGGCGGCGGAGGCCATTCTCCG
 GGAGCGGGAGCGGGGCGGCCCTACCGGAGCCTCGGCGAC
 TTCTCAAGCGGCTGGACGAGAAGGTGCTCAACAAGCGGA
 CCCTGGAGTCCCTCATCAAGGCGGGCGCCCTGGACGGCTT
 CGGGGAAAGGGCGCGGCTCCTCGCCTCCCTGGAAGGGCTC
 CTCAAGTGGGCGGCCGAGAACCGGGAGAAGGCCCGCTCGG
 GCATGATGGGCCTCTTCAGCGAAGTGAGGAGCCGCCTTT
 GGCCGAGGCCCGCCCCCTGGACGAGATCACCCGGCTCCGC
 TACGAGAAGGAGGCCCTGGGGATCTACGTCTCCGGCCACC
 CCATCTTGCGGTACCCCGGGCTCCGGGAGACGGCCACCTG
 CACCCTGGAGGAGCTTCCCCACCTGGCCCGGGACCTGCCG
 CCCCCTGTAGGGTCTCCTTGCCGGGATGGTGGAGGAGG
 TGGTGCAGCAAGCCCAAAAGAGCGGCGGGATGATGGCCCG
 CTTCGTCTCTCCGACGAGACGGGGGCGCTTGAGGCGGTG
 GCATTGCGCCGGGCCTACGACCAGGTCTCCCCGAGGCTCA
 AGGAGGACACCCCCGTGCTCGTCTCGCCGAGGTGGAGCG
 GGAGGAGGGGGCGTGCGGGTGCTGGCCCAGGCCGTTTGG
 ACCTACGAGGAGCTGGAGCAGGTCCCCCGGGCCCTCGAGG
 TGGAGGTGGAGGCCTCCCTCCTGGACGACCGGGGGGTGGC
 CCACCTGAAAAGCCTCCTGGACGAGCACGCGGGGACCCTC
 CCCCTGTACGTCCGGGTCCAGGGCGCCTTCGGCGAGGCC
 TCCTCGCCCTGAGGGAGGTGCGGGTGGGGGAGGAGGCTGT
 AGGCGGCCGCGTGGTTCCGGGCCTACCTCCTGCCCGACCG
 GGAGGTCTTCTCCAGGGCGGCCAGGCGGGGGAGGCCAG
 GAGGCGGTGCCCTTCTAGGGGGTGGGCCGTGAGACCTAGC
 GCCATCGTTCTCGCCGGGGCAAGGAGGCCTGGGCCCCGAC
 CCCTTTTGG

1920
 2040
 2160
 2280
 2400
 2520
 2640
 2760
 2880
 3000
 3120
 3240
 3360
 3480
 3600
 3720

FIG. 16B

MGRELRF AHLHQHTQFSLLDGAPKLSDLLKWVEETTPEDP	
ALAMTDHGNLFGAVEFYKKATEMGIKPILGYEAYVAAESR	
FDRKRGKGLDGGYFHLTLLAKDFTGYQNLVRLASRAYLEG	120
FYEKPRIDREILREHAEGLI ALSGCLGAEIPQFILQDRLD	
LAEARLNEYLSIFKDRFFIEIQNHGLPEQKKVNEVLKEFA	
RKYGLGMVATNDGHYVRKEDARAHEVLLAIQSKSTLDDPG	240
ALALPCEEFYVKTPEEMRAMFPEEEVGGRSPLTTPWRSPH	
VQRGAAIGTRWSTRIPRFPLPEGRTEAQYLMELTFKGLLR	
RYPDRITEGFYREVFRLSGKLPPHGDGEALAEALAQVERE	360
AWERLMKSLPPLAGVKEWTAEAFHRALYELSAIERMGFP	
GLLPHRPGHLHQLGPEKGVSVGPGRGGAAGSLVAYAVGITN	
IDPLRFGLLFERFLNPERVSMPDIDTDFSDRERDRVIQYV	480
RERYGEDKVAQIGTLGSLASKAALKEVARVYGI PRKKAEE	
LAKLIPVQFGKPKPLQEA IQVVP ELRAEMEKDPKVREVLE	
VAMRLEGLNRHASVHAGRGGVFSEPLTDLVPLCATRKGGP	600
YTQYDMGAVEALGLLKMDFLGLRTLTLFLDEVKRIVKASQG	
VELDYDALPLDDPKTFALLSRGETKGVFQLESGGMTATLR	
GLKPRRFEDLIAILSLYRPGPMEHIPTYIRRHGLEPVSY	720
SEFPHAEKYLKPILDETYGIPVYQEQIMQIASAVAGYSLG	
EADLLRRSMGKKKVEEMKSHRERFVQAKERGVPEEEANR	
LFDMLEAFANYGFNKSHAAAYSLLSYQTAYVKAHYPVFEM	840
AALLSVERHDSKVAEYIRDARAMGIEVLPPDVNRSGFDF	
LVQGRQILFGLSAVKNVGEAAAEAILRERERGGPYRSLGD	
FLKRLDEKVLNKRTLES LIKAGALDGFERARLLASLEGL	960
LKWAAENREKARSGMMGLFSEVEEPPLAEAAPLDEITRLR	
YEKEALGIYVSGHPILRYPGLRETATCTLEELPHLARDLP	
PRSRVLLAGMVEEVVRKPTKSGGMMARFVLSDETGALEAV	1080
AFGRAYDQVSPRLKEDTPVLVLAEVEREEGGVRVLAQAVW	
TYQELEQVPRALEVEVEASLPDDRGV AHLKSLLDEHAGTL	
PLYVRVQGA FGEALLALREVRVGEEALGALEAAGFPAYLL	1200
PNREVSPRLTGSGGPRGRALSTGLALKTYP IALPGGNEAL	
ARPLL	

FIG. 16C

	Start1	Start2	3'-Exo I
T.th.	VERVVRTLLDGRFLLEEGVGLWENRYPFPEGEAVVVDLLETTGLAG-----LDEVIEVGLRLLEGG---RRLPF		
D.rad.		PWPQDVVVFDDLETTGFSPA-----SAAIVEIGAVRIVGGQIDETLKF	
Bac.sub.	HGIKMIYMEANLVDDGVPIAYNAAHRLLEEETVVVFDVETTGLSAV-----YDTIIELAAVKVKGGE--IIDKF		
H.inf.		MINPNRQIVLDTFETTGMMNQLGHAHYEGHCHIIIEIGAVELINRR-YTGNNX	
E.c.		MSTAITRQIVLDTFETTGMMNQIGAHSEGHKIIIEIGAVEVNNRR-LTGNNF	
H.pyl.	NLEYLKACGLNFIEETSENLTILKNLKTPLKDEVFSFIDLETTGSCPI-----KHEILLEIGAVQVKGGE--IINRF		

	3'-Exo II
T.th.	QSLVR-PLPP---AEARSWNLT---GIPREALLEAPSLEEVLEKAYPLRGDATLVIHNAAFDLGFL-RPALEGLG
D.rad.	ETLVR-PTRPDGSMLSI PWQAQRVHGISDEMVRRAPAKKDVL PDDFFDVGSAVVAENVSFDDGGFM-RAGAERLG
Bac.sub.	EAFAN-PHRP---LSATIIELT---GITDDMLQDAPVDVDIRDFREWIGDDILVAENASFDMGFL-NVAYKKLL
H.inf.	HIYIK-PDRP---XDPDAIKVH---GITDEMLADKPEFKEVAQDFLDYINGAELLIHNAFPDVGFM-DYEFKRLN
E.c.	HVYLK-DRLV---DPEAFGVH---GIAVDFLDKPTFAEVAVEFMDYIRGAELVTHNAAFDVGFM-DYEFSLK
H.pyl.	ETLVKVSVP-----DYIAELT---GITYEDTLNAPSAHEALQELRLFLGNSVFVAHNANFDYNFLGRYFVEKLH

	3'-Exo IIIC
T.th.	-----YRLENPVVDSLRRLARRGLPGLRRYGLDALSEVLELPRRT--CHRALEDVERTLAVVHEVYYMLT-----SG
D.rad.	-----LSWAPERELCTMQLSRRAFP RERTHNLTVLAERLGLLEFAPGGRHRSYGDVQVTAQAYLRLLLELGL-----ER
Bac.sub.	E---VEKAKNPVIDTLELGRFLYPEFKNHRNLTLCKKFDIELTQ--HHRATYDTEATAYLLKMLKDA-----EK
H.inf.	-LNVKTDDICLVDTLQMARQMPGKRN-NLDALCDRLGIDNSKRTLHGALLDAEILADVLYLMMTGGQTNLFDEEE
E.c.	RDIAKTNTFCVKVTDLSLAVARKMFPGKRN-SLDALCARYEIDNSKRTLHGALLDAQILAENVYLA MTGGQTSMAFAME
H.pyl.	-----CPLLNLKLCITDLSKRAILSMRY-SLSFLKELLGFGIEV--SHRAYADALASYKLFEICLLNLP--SYIKT

FIG.17

FIG.18A

ATGGTGGAGCGGGTGGTGC GGACCCTTCTGGACGGGAGGT 40
 TCCTCCTGGAGGAGGGGGTGGGGCTTTGGGAGTGGCGCTA
 CCCCTTTCCCCTGGAGGGGGAGGCGGTGGTGGTCCTGGAC 120
 CTGGAGACCACGGGGCTTGCCGGCCTGGACGAGGTGATTG
 AGGTGGGCCTCCTCCGCCTGGAGGGGGGGAGGCGCCTCCC 200
 CTTCCAGAGCCTCGTCCGGCCCCCTCCCGCCCGCCGAAGCC
 CGTTCGTGGAACCTCACCGGCATCCCCCGGGAGGCCCTGG 280
 AGGAGGCCCCCTCCCTGGAGGAGGTTCTGGAGAAGGCCTA
 CCCCCTCCGCGGCGACGCCACCTTGGTGATCCACAACGCC 360
 GCCTTTGACCTGGGCTTCCTCCGCCCGGCCTTGGAGGGCC
 TGGGCTACCGCCTGGAAAACCCCGTGGTGGACTCCCTGCG 440
 CTTGGCCAGACGGGGCTTACCAGGCCTTAGGCGCTACGGC
 CTGGACGCCCTCTCCGAGGTCTTGGAGCTTCCCCGAAGGA 520
 CCTGCCACCGGGGCCCTCGAGGACGTGGAGCGCACCCCTCGC
 CGTGGTGCACGAGGTATACTATATGCTTACGTCCGGCCGT 600
 CCCC GCACGCTTTGGGA ACTCGGGAGGTAG

MVERVVRTLLDGRFLLEEGVGLWEWRYPFPLEGEAVVVLD 40
 LETTGLAGLDEVIEVGLLRLEGGRRLPFQSLVRPLPPAEA
 RSWNLTGIPREALEEAPSLEEVLKAYPLRGDATLVIHNA 120
 AFDLGFLRPALEGLGYRLNPVVD SLRLARRGLPGLRRYG
 LDALSEVLELPRRTCHRALEDVERTLAVVHEVYYMLTSGR 200
 PRTLWELGRZ

FIG.18B

Alignment of dnaA genes.

P. mar.	MLEASWEK VQSSL--KQNLKSK--	-----PSYE TWIRPTESG--FKN GELTLAPNSFSSAW LKNYSQTIQETAE--	65
Syn. sp.	MVSCENLWQQ ALAIL--ATQLTK--	-----PAFD TWIKASVLIS--LGD GVATIQVENGFLVNH LQKSYGPLIMEVLT--	67
B. sub.	MENILDLWQ ALAQI--EKGLSK--	-----PSFE TWKSTKAHS--LQG DTLTITAPNEFARDW LESRYLHLIADTIY--	67
M. tub.	MTDDPGSGFTTWNA WSELNGDFKVDGSP	SSDANLSAPLTPQOR AMLNLVQPLT--IVE GFALLSVPSFVQNE IERHLRAPITDALS--	87
T. th.	MSHEAVWQH VLEHI--RRSITE--	-----VEFH TWFERIRPLG--IRD GVLELAVPTSFALDW IRRHYAGLIQEGPR--	66
E. coli	MSLSLWQQ CLARL--QDELPA--	-----TEFS MWIRPLQAE--LSD NTLALYAPNRVFLDW VRDKYLNININGLLT--	64
T. mar.	MKER ILQEI--KTRVNR--	-----KSWE LMFSSFDVKS--IEG NKVVFSVGNLFIREM LEKKYSVLSKAVK--	61
H. pyl.	MDTNNNIEKE ILALVKQNPVSL--	-----IEYE NYFSOLKYNPNASKS DIAFFYAPNQVLCCT ITARYGALLKEILSQ	72
P. mar.	EIFG---EPVTVHVK VKANAESSDEHYSSA P-----	---ITPPLEASPGSV DSSGSSLRLSK--- -KTLPLILNLRVVFNR	130
Syn. sp.	DLTG---QEITVKLI TDGLEPHS---LIGQ E-----	---SSLPMETTP--- -KNATALNGKYTFSR	115
B. sub.	ELTG---EELSIFV IPQNQDVEDFMKPKQ VKAKVEDTSDFPQN	-----EIDDSAAARGDINQHS WPSYFTERPHNTDSA TAGVTSINRRYTFDT	119
M. tub.	RLGH-QIQLGVRIA PPATDEADDTVPSP ENPATISPDITTDND	-----PPAQAP-----	176
T. th.	LLGAQ-APRFELRV PGVVQEDIFQPPPS PPAQAP-----	-----EDTFKT	108
E. coli	SFCGADAPQLRFVVG TKPVTQTPQAAVTSN VAAPQAQVQTPQRA	APSTRSGWNVNPPA EP----- -TYRSNVNVKHTFDN	140
T. mar.	VVLG---NDATFEIT YEAFEPHSSYSEPLV KRAVLLTP-----	-----LNPDYTFEN	106
H. pyl.	NKVG-MHLAHSVDVR IEVAPKIQINAQSN I NYKAIKTS-----	-----VKDSYTFEN	118
P. mar.	FVVGPNRMAHAAAM AVAESPGREFNPLFI CGGVGLGKTHLMQAI	GHYRLEIDPGAKVSY VSTETFTNDLIL--A IRQDRMQAFDRYR--	217
Syn. sp.	FVVGPTNRMAHAAASL AVAESPGREFNPLFL CGGVGLGKTHLMQAI	AHYRLEMYPNKAVVY VSTERFTNDLIT--A IRQDNMEDFRSYR--	202
B. sub.	FVIGSGNRFHAHAASL AVAEAPAKAYNPLFI YGGVGLGKTHLMHAI	GHYVIDHNPSAKVY LSSEKFTNEFIN--S IRONKAVDFNRVYR--	206
M. tub.	FVIGASNRFAHAAAL ALAEAPARAYNPLFI WGESGLGKTHLLHAA	GNVAQRLFGMRVY VSTEEFTNDFIN--S LRDRKVAFKRSYR--	263
T. th.	SWMGPTTPWPHGGAV AVAESPGRAYNPLFI YGGRLGKTYLMHAV	GPLRAKRFPHMRLEY VSTETFTNELINRPS AR-DRMTEFRERYR--	196
E. coli	FVEGKSNQLARAAAR QVADNPGGAYNPLFL YGGVGLGKTHLLHAV	GNGLMARKPNKAVVY MHSEFVQDMVK--A LQNNATEEFKRYR--	227
T. mar.	FVVGSGNSFAYHAAL EVAKHPGR--YNPLFI YGGVGLGKTHLLQSI	GNVYVQNEPDLRMVY ITSEKFLNDLVD--S MKEGKINEFREKRYK	193
H. pyl.	FVVGSCNNTVYELAK KVAQSDTPPPYNPVLF YGGVGLGKTHLLNAI	GNHALEK--HKKVVL VTSEDFLTDLFLK--H LDNKTMDSEKAKYR--	203

FIG. 19A

P.mar. AADLILVDDIQFIEG KEYTQEEFFHTFNAL HDAGSQIVLASDRPP SQIPRQERLMSRFS MGLIADVQAPDLETR MAILQKKAHERVGL 307
 Syn.sp. SADFLILLIDDIQFIKG KEYTQEEFFHTFNAL HEAGQVWVASDRAP QRIFGLQDRILSRFS MGLIADIQVPLETR MAILQKKAHEYDRIRL 292
 B.sut. NVDVILLIDDIQFIQFIEG KEYTQEEFFHTFNAL HEESQIVISSDRPP KEIPTLEDRLSRFE MGLITDITPPDLETR IAILRKKAKABGLDI 296
 M.tub. DVDVILLVDDIQFIEG KEGIQEEFFHTFNAL HNANKQIVISSDRPP KQATLEDRLSRFE MGLITDQVQPELETR IAILRKKAKABGLDI 353
 T.th. SVDLILLVDDIQFIEG KERTQEEFFHTFNAL YEAKQIILSSDRPP KQATLEDRLSRFE MGLITDQVQPELETR IAILRKKAKABGLDI 353
 E.coli SVDALLIDDIQFIFAN KERSQEEFFHTFNAL LEGNQIILSSDRPP KEINGVEDRLSRFG MGLITVAIEPPELETR IAILKKNAS-SGPED 285
 T.mar. KVDILLIDDVQFLIG KTGQVQTELHFTFNEL HDGKQIVICSREP QKLSEFQDRLVSRFQ MGLIVAKLEPPDEETR VAILMKKADENDIRL 317
 H.pyl. HCDFFLLDDAQFLOG KPKLEEEFFHTFNEL HANSQIVLISDRSP KNIALGLEDRLSRFE WGITAKVMPDLETK LSIVKQKCQLNQITL 283 293

P.mar. PRDLIQFIAGRFTSN IRELEGALTRALAFASITGLPMTVDSIAPM LD-----PNGQVEVT PKQVLDKVAEVFKVT PDEMRSASRRR-PVS 392
 Syn.sp. PKEVIEYIASHYTSN IRELEGALTRALAFASITGLPMTVDSIAPM LD-----PNGQVEVT PKQVLDKVAEVFKVT PDEMRSASRRR-PVS 392
 B.sut. PNEVMLYIANQIDSN IRELEGALIRVWAYS SLINKDINADLAAEA LKDIIPSSPKPVIT IKEIQRVVGQFQFNIK VEELLSNSRRR-EVS 377
 M.tub. PDDVLELIIASSIERN IRELEGALIRVWAYS SLINKDINADLAAEA LKDIIPSSPKPVIT IKEIQRVVGQFQFNIK VEELLSNSRRR-EVS 384
 T.th. PEDALEYIARQVTSN IRELEGALIRVWAYS SLINKDINADLAAEA LKDIIPSSPKPVIT IKEIQRVVGQFQFNIK VEELLSNSRRR-EVS 441
 E.coli PGEVAFIARQVTSN IRELEGALIRVWAYS SLINKDINADLAAEA LKDIIPSSPKPVIT IKEIQRVVGQFQFNIK VEELLSNSRRR-EVS 372
 T.mar. PEEVLFNVAENVDN LRRLRGALIKLIVYK ETTGKEVDLKEAILL LKDFIKPNRVKAMP IDELIEIVAKVITGVP REEILSNSRV-KAL 404
 H.pyl. PEEVMEYLAQHISDN IRQMEGALIKISVNA NLMNASIDLNLAKTV LEDL--QKDHABGSS LENILLAVAQSLNLK SSEIKVSSRQK-NVA 372 380

P.mar. QARQVGYLMRQGTN LSLPRIGDTFGGKDH TTVMYAIEQVEKKLS S-----DPQIA SQVQKIRDLQIDSR RKR----- 461
 Syn.sp. LARQVGYLMRQHTD LSLPRIGDTFGGKDH TTVMYAIEQVEKKLS S-----DPQIA SQVQKIRDLQIDSR RKR----- 461
 B.sut. FPRQIAMYLREMTD SSLPKIGEEFGGRDH TTVIHAHEKISKLLA D-----DEQLQ QHVKEIKEQLK----- 447
 M.tub. QSRQIAMYLCRELTD LSLPKIGQAFG-RDH TTVMYAQRKILSEMA E-----RREVF DHVKELTTRIRQSK R----- 446
 T.th. LPRQIAMYLRELTP ASLPEIGQLFGGRDH TTVRYAIOKVQELAG KP-----DREVQ GLRLTLREACTDFVD NLWITCG 507
 E.coli RPRQAMALAKELTN HSLPEIGDAGGRDH TTVLHACRKEIQLE E-----SHDIK EDFSNLIRTLSS----- 446
 T.mar. TARRIGMYVAKNYLK SSLRTIAEFN-RSH PVVDSVKKVKDSSL KG-----NKQLK ALIDEVIGEISRRAL SG----- 467
 H.pyl. LARKLVVYFARLYTP NPTLSLAQFLDLKDH SSISKMYSGVKKMLE EEKSPFVLSLREEIK NRINEINDKKTAFNS SE----- 440 457

FIG.19B

GTGTGCGCAGAGGCCGTCTGGCAACACGTTCTGGAGCA⁻
 TCCGCCGCAGCATCACCGAGGTGGAGTTCCACACCTGGTT
 TGAAAGGATCCGCCCCCTGGGGATCCGGGACGGGGTGCTG 120
 GAGCTCGCCGTGCCACCTCCTTTGCCCTGGACTGGATCC
 GCGGCCACTACGCCGGCCTCATCCAGGAGGGCCCTCGGCT
 CCTCGGGGCCAGGCGCCCCGGTTTGAGCTCCGGGTGGTG 240
 CCCGGGGTCGTTAGTCCAGGAGGACATCTTCCAGCCCCCGC
 CGAGCCCCCGGCCAAGCTCAACCCGAAGATACCTTTAA
 AACTTCGTGGTGGGGCCCAACAACCTCCATGGCCCCACGGC 360
 GCGCCGTGGCCGTGGCCGAGTCCCCCGGCCGGGCTACA
 ACCCCCTCTTCATCTACGGGGGCCGTGGCCTGGGAAAGAC
 CTACCTGATGCACGCCGTGGGCCCACTCCGTGCGAAGCGC 480
 TTCCCCCACATGAGATTAGAGTACGTTTCCACGGAACTT
 TCACCAACGAGCTCATCAACCGGCCATCCGCGAGGGACCG
 - GATGACGGAGTTCCGGGAGCGGTACCGCTCCGTGGACCTC 600
 CTGCTGGTGGACGACGTCCAGTTTCATCGCCGGAAAGGAGC
 GCACCCAGGAGGAGTTTTTCCACACCTTCAACGCCCTTTA
 CGAGGCCCACAAAGCAGATCATCCTCTCCTCCGACCGGCCG 720
 CCAAGGACATCCTCACCCTGGAGGCGCGCCTGCGGAGCC
 GCTTTGAGTGGGGCCTGATCACCGACAATCCAGCCCCCGA
 CCTGGAAACCCGGATCGCCATCCTGAAGATGAACGCCAGC 840
 AGCGGGCCTGAGGATCCCGAGGACGCCCTGGAGTACATCG
 CCCGGCAGGTCACCTCCAACATCCGGGAGTGGGAAGGGGC
 CCTCATGCGGGCATCGCCTTTCGCCTCCCTCAACGGCGTT 960
 GAGCTGACCCGCGCCGTGGCGGCCAAGGCTCTCCGACATC
 TTCGCCCCAGGGAGCTGGAGGCGGACCCCTTGAGATCAT
 CCGCAAAGCGGCGGGACCAGTTCGGCCTGAAACCCCGGGA 1080
 GGAGCTCACGGGGAGCGCCGCAAGAAGGAGGTGGTCCTCC
 CCCGGCAGCTCGCCATGTACCTGGTGCGGGAGCTCACCCC
 GGCCTCCCTGCCCGAGATCGACCAGCTCAACGACGACCGG 1200
 GACCACACCACGGTCTCTACGCCATCCAGAAGGTCCAGG
 AGCTCGCGGAAAGCGACCGGGAGGTGCAGGGCCTCCTCCG
 CACCCTCCGGGAGGCGTGCACATGA

FIG.20A

VSHEAVWQHVL EHIRRSITEVEFHTWFERIRPLGIRDGVL
ELAVPTSFALDWIRRH YAGLIQEGPRLPGAQAPRFELRVV
PGVVQEDIFQPPSPPAQAQPEDTFKTSWWGPTTPWPHG 120
GAVAVAESPGRAYNPLFIYGG RGLGKTYLMHAVGPLRAKR
FPHMRLEYVSTETFTNELINRPSARDRMTEFRERYRSVDL
LLVDDVQFIAGKERTQE EFFT FNALYEAHKQIILSSDRP 240
PKDILTLEARLRSRFEWGLITDNPAPDLETRIAILKMNAS
SGPEDPEDALEYIARQVTSNIREWEGALMRASPFASLNGV
ELTRAVAAKALRHLRPRELEADPLEIIRKAAGPVRPETPG 360
GAHGERRKKEVVLPRQLAMYL VRELTPASLPEIDQLNDDR
DHTTVLYA IQKVQELAESDREVQGLLRTLREACT

FIG.20B

ATGAACATAACGGTTCCCAAAAACTCCTCTCGGACCAGC 40
 TTTCCCTCCTGGAGCGCATCGTCCCCTCTAGAAGCGCCAA
 CCCCCTCTACACCTACCTGGGGCTTTACGCCGAGGAAGGG 120
 GCCTTGATCCTCTTCGGGACCAACGGGGAGGTGGACCTCG
 AGGTCCGCCTCCCCGCCGAGGCCCAAAGCCTTCCCCGGGT 200
 GCTCGTCCCCGCCAGCCCTTCTTCCAGCTGGTGCGGAGC
 CTTCTGGGGACCTCGTGCCCTCGGCCTCGCCTCGGAGC 280
 CGGGCCAGGGGGGGCAGCTGGAGCTCTCCTCCGGGCGTTT
 CCGCACCCGGCTCAGCCTGGCCCCCTGCCGAGGGCTACCCC 360
 GAGCTTCTGGTGCCCGAGGGGGAGGACAAGGGGGCCTTCC
 CCTCCGGACGCGGATGCCCTCCGGGGAGCTCGTCAAGGC 440
 CTTGACCCACGTGCGCTACGCCGCGAGCAACGAGGAGTAC
 CGGGCCATCTTCCGCGGGGTGCAGCTGGAGTTCTCCCCC 520
 AGGGCTTCCGGGCGGTGGCCTCCGACGGGTACCGCCTCGE
 CCTCTACGACCTGCCCCCTGCCCAAGGGTTCCAGGCCAAG 600
 GCCGTGGTCCCCGCCCGAGCGTGGACGAGATGGTGCGGG
 TCCTGAAGGGGGCGGACGGGGCCGAGGCCGTCTCGCCCT 680
 GGGCGAGGGGGTGTGTCGCCCTGGCCCTCGAGGGCGGAAGC
 GGGGTCCGGATGGCCCTCCGCCTCATGGAAGGGGAGTTCC 760
 CCGACTACCAGAGGGTCAATCCCCAGGAGTTCGCCCTCAA
 GGTCCAGGTGGAGGGGGAGGCCCTCAGGGAGGCGGTGCGC 840
 CGGGTGAGCGTCTCTCCGACCGGCAGAACCACCGGGTGG
 ACCTCCTTTTGGAGGAAGGCCGGATCCTCCTCTCCGCCGA 920
 GGGGGACTACGGCAAGGGGCAGGAGGAGGTGCCCCGCCAG
 GTGGAGGGGCCGACATGGCCGTGGCCTACAACGCCCGCT 1000
 ACCTCCTCGAGGCCCTCGCCCCCGTGGGGGACCGGGCCCA
 CCTGGGCATCTCCGGGCCCCACGAGCCCGAGCCTCATCTGG 1080
 GGGGACGGGGAGGGGTACCGGGCGGTGGTGGTGCCCTCA
 GGGTCTAG 1128

FIG.21A

MNITVPKKLLSDQLSLLERIVPSRSANPLYTYLGLYAEEG 40
ALILFGTNGEVDLEVRLPAEAQSLPRVLVPAQPFFQLVRS
LPGDLVALGLASEPGQGQLELSSGRFRTRLAPAEGLYP 120
- ELLVPEGEDKGAFPLRTRMPSELVKALTHVRYAASNEEY
RAIFRGVQLEFSPQGFRAVASDGYRLALYDLPLPQGFQAK 200
AVVPARSVDEMVRVLKGADGAEAVLALGEGVLALALEGGS
GVRMALRLMEGEFPDYQQRVIPQEFALKVQVEGEALREAVR 280
RVSLSDRQNHRVDLLLEEGRILLSAEGDYGKGQEEVPAQ
VEGPDMAVAYNARYLLEALAPVGDRAHLGISGPTSPSLIW 360
GDGEGYRAVVVPLRVZ

FIG.21B

T.th.beta
E.coli.bet
P.mirab.be
H.infl.bet
P.put.beta
B.cap.beta

MNITVPKLLSDQLSLERIVPSRSANPLYTYLGLYAEAGALILFGTNGEVDLEVRLP
AE MKFTVEREHLKPLQOVSGPLGGRPTLPILGNLLQVADGTLSTGTDLEMEMVARVALV
MKFTIEREQLKPLQOVSGPLGGRPTLPILGNLLKVTENTLSLGTDLLEMEMMARVSL
MQFSISRENLLKPLQOVCGVLSNRPNIPVANNVLLQIEDYRLTITGTDLLEVELSSQTQLS
MHFTIQREALKPLQVAGVVERQTLPVLSNVLLWQQQLSLGTDLLEVELVGRVQLE
MKFTIQNDILTKNLKKTITRVLVKNISFPILLENILIQVEDGTLSTATTNLEIKLISKIEII
* * * * *

T.th.beta
E.coli.bet
P.mirab.be
H.infl.bet
P.put.beta
B.cap.beta

AQSLP-RVLVPAQFFQVLRSLPGDIALGLASEPGQGQLELSSGRFTRLSLAPAGY
QPHEPGATTVPARKFFDICTRGLP-EGAEIYVQLE---GERMLVRSGRSRFSLSTLPAADF
QSHEIGATTVPARKFFDICTRGLP-EGAEISVELD---GDRLLVRSGRSRFSLSTLPASDF
SSSENGTFTIPAKKFLDICTRLS-DDSEITVTFE---QDRALVQSGRSRFTLATQPAEEY
EPAEPGEITVPARKLMDICKSLP-NDALIDIKVD---EQKLLVKAGRSRFTLSTLPANDF
TKYIPGKTTISGRKIILNICTRLS-EKSKIKMQLK---NKKWYISSENSNYILSTLSADTF
* * * * *

T.th.beta
E.coli.bet
P.mirab.be
H.infl.bet
P.put.beta
B.cap.beta

PELLVPEGEDKGAFLTRMPSGELVKALTHVRYAASNEEYRAIFRGVQLEFSPQGFRV
PNLDD--WQSEVEFTLPQAT----MKRLIEATQFSMAHQDVRYVYINGMLFETEGEELRTV
PNLDD--WQSEVEFTLPQAT----LKRLIESTQFSMAHQDVRYVYINGMLFETENTELRTV
PNLTD--WQSEVDFELPONT----LRLIETATQFSMANQDARYFLNGMKFETEGNLLRTV
PTVEE--GPGSLTCNLEQSK----LRLIERTSFAMAQDVRYVYINGMLLEVSRNTLRV
PNHQN--FDYISKFDISSNI----LKEMIEKTEFSMGKQDVRYVYINGMLLEKKDKFLRSV
* * * * *

T.th.beta
E.coli.bet
P.mirab.be
H.infl.bet
P.put.beta
B.cap.beta

ASDGYRLALYDLPLPQGFQA--KAWPARSVDEMVRVLKGADGAVALGEGVLALALE
ATDGHRLAVCSMPIGQSLPS-HSVIVPRKGVIELMRMLDG-GDNPLRVQIGSNINRAHVG
ATDGHRLAVCAMDIGQSLPG-HSVIVPRKGVIELMRLLDGSGESLLQLQIGSNINRAHVG
ATDGHRLAVCTISLEQELQN-HSVILPRKGVLELVRLET-NDEPARLQIGTNNLRVHLK
STDGHRLALCMSAPIEQEDRHQVIVPRKGILELARLLTD-PEGWVSIVLGQHHIRATTG
ATDGYRLAISYTQKKOINF-FSIIIPNKAVMELLKLANT-QPQLNILIGSNSIRIYTK
** *** * * * *

FIG.22A

T.th.beta
E.coli.bet
P.mirab.be
H.infl.bet
P.put.beta
B.cap.beta

GGSGVRMALRLMEGEFPDYQORVTPQEFALKVQVEGEALREAVRRVSVLSDRQNHVRVDLLL
----DFIFTSKLVNDFGRFPDYRRVLPKNPDKHLEAGCDLLKQAFARAAAILSNEKFRGVRLYV
----DFIFTSKLVNDFGRFPDYRRVLPKNPDKHLEAGCDLLKQAFARAAAILSNEKFRGVRLYV
---NTVFTSKLIDGRFPDYRRVLPKNATKIVEGNWEMLKQAFARASILSNERARSVRLSL
---EFTFTSKLVNDFGRFPDYRRVLPKNATKIVEGNWEMLKQAFARASILSNERARSVRLSL
---NLIFTTQLEGEFPDYKSVLFKEKNPIITNSILLKSLRLVAILAHEKFCGIEIKI
...*** *... *... *... *

T.th.beta
E.coli.bet
P.mirab.be
H.infl.bet
P.put.beta
B.cap.beta

EEGRILLSAEGDYGK-QQEEVPAQVEGPDMAVAYNARYLLEALAPVG-DRAHLGISGPTS
SENQLKITANNPEQEEAEELDVITYSGAEMEIGFNVSVYLDVNLALKCENVRMMLTDSVS
TNGQLKITANNPEQEEAEELDVITYSGAEMEIGFNVSVYLDVNLALKCENVRMMLTDSVS
KENQLKITASNTHEEEAEELDVITYSGAEMEIGFNVSVYLDVNLALKCENVRMMLTDSVS
AAGQLKIQANNPEQEEAEELDVITYSGAEMEIGFNVSVYLDVNLALKCENVRMMLTDSVS
ENGKFKVLSDNQEEETAEDLFEIDYFGEKIEISINVVYLLDVNNIKSENIALFLNKS
... *... *... *... *

T.th.beta
E.coli.bet
P.mirab.be
H.infl.bet
P.put.beta
B.cap.beta

PSLIWGDG-EGYRAVVVPLRVZ (ID#108)
SVQIEDAASQSAAYVMPMLZ (ID#109)
SVQVENVASAAAAYVMPML- (ID#110)
SCLIENCEDSSCEYVMPML- (ID#111)
SALIQEAGNDSSYVMPML- (ID#112)
SIQIEAENSSNAYVVMLKR- (ID#113)
... *... *... *

FIG.22B

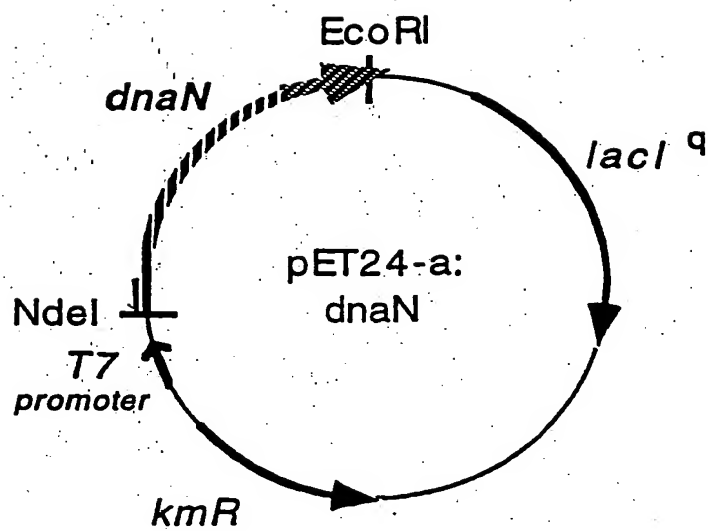
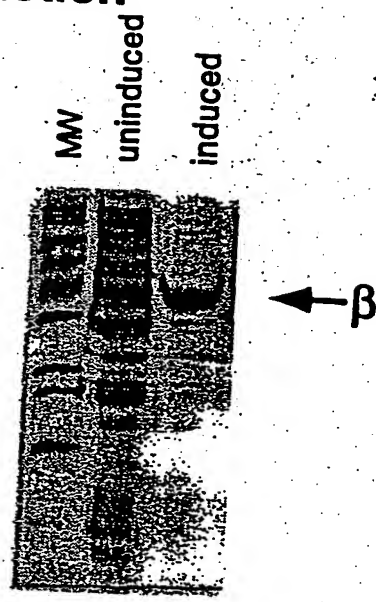


FIG.23

FIG.24A Induction



↓
Lysis
↓
Heat Step
↓

FIG.24B MonoQ Column

Fraction: 5 7 9 11 13 15 17 19 21 23 25

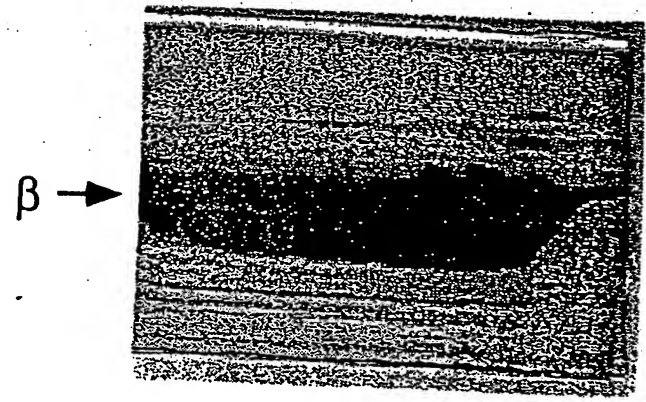


FIG.25A

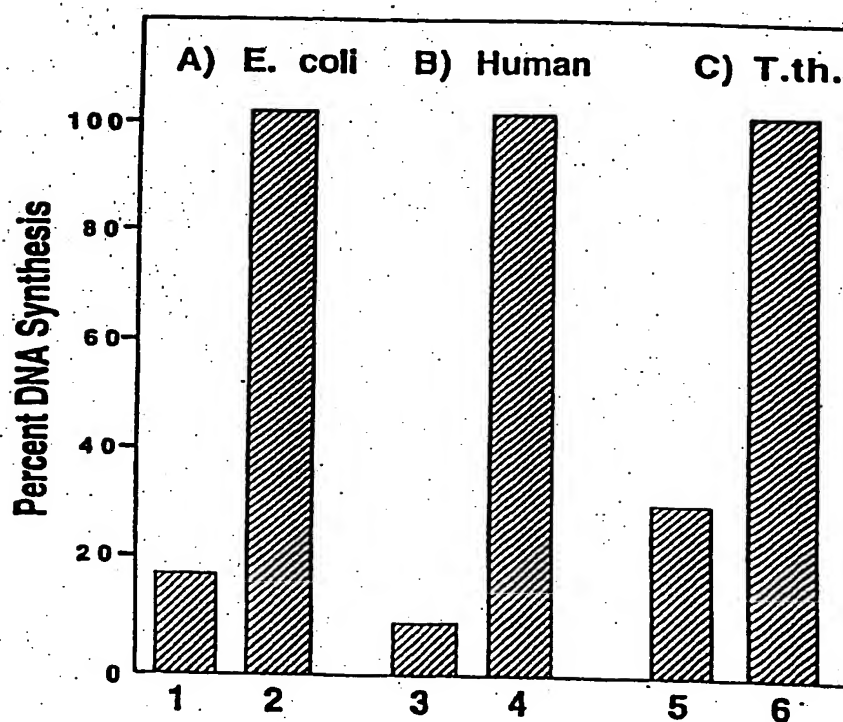
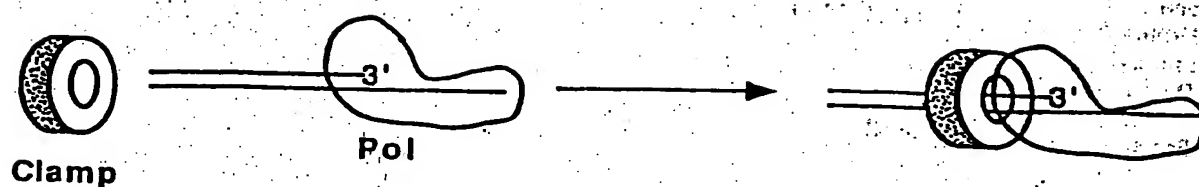


FIG.25B

FIG. 26A

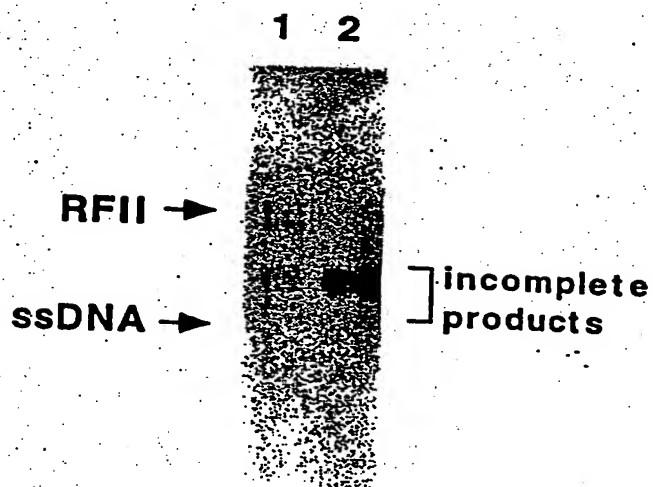
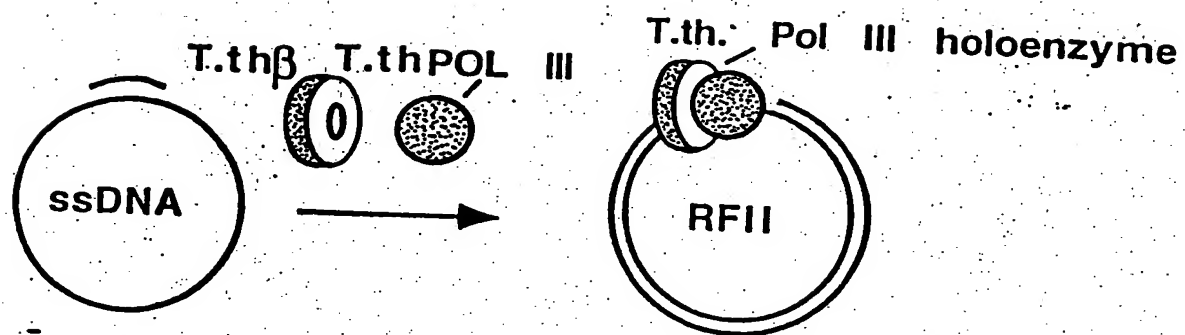


FIG. 26B

α τ δ δ' SSB ϵ



FIG. 27

2 4 6 8 10 12 14 16 18 20 22 24 26 28 σ 30 32 34 36 38 40 42 44 46 48 50 52 54

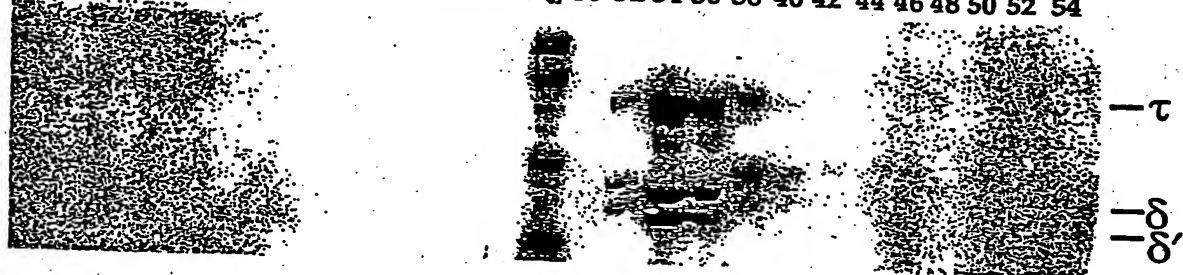


FIG. 28

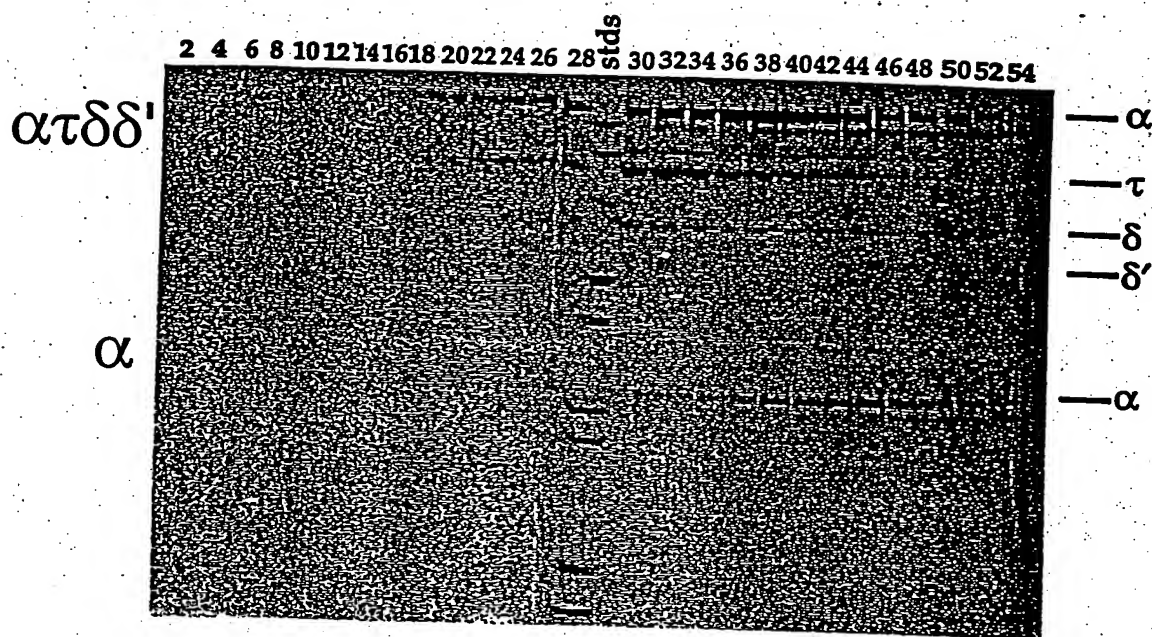


FIG. 29

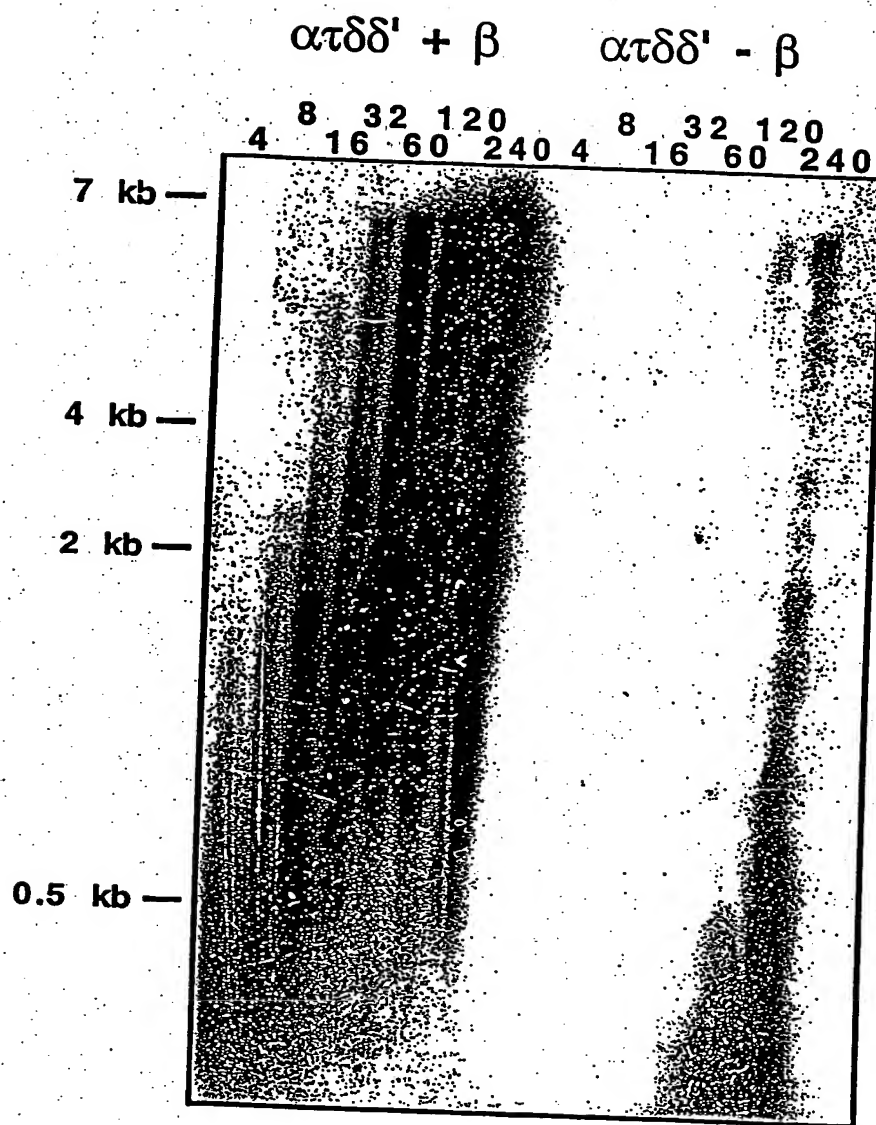


FIG. 30

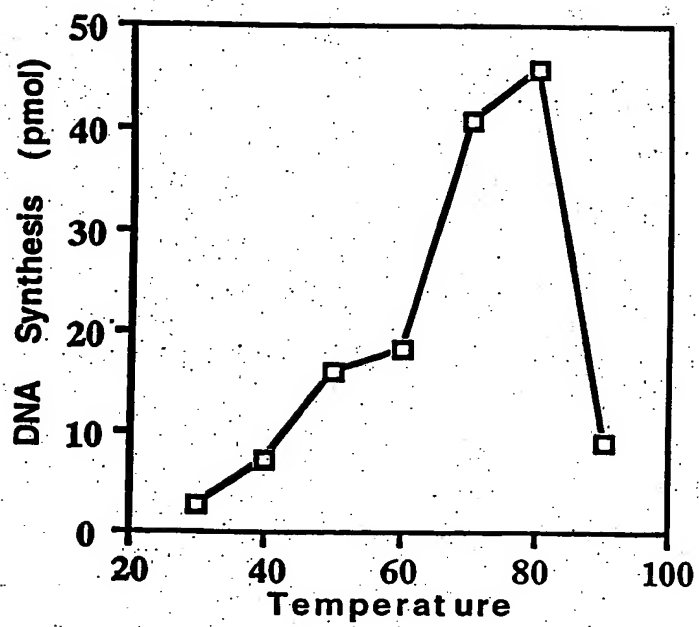


FIG. 31

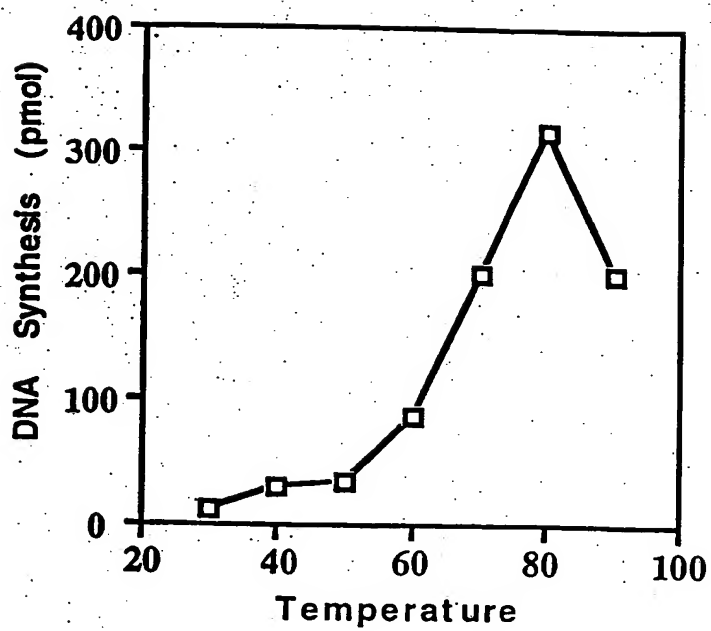


FIG. 32

α

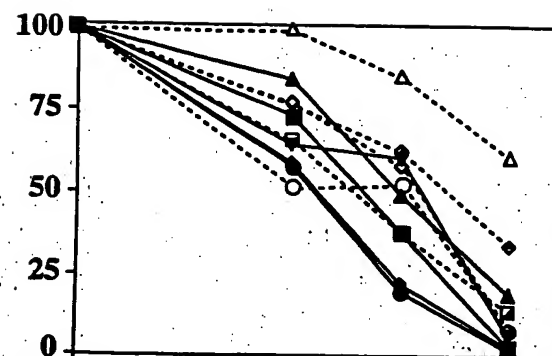


FIG. 33A

β

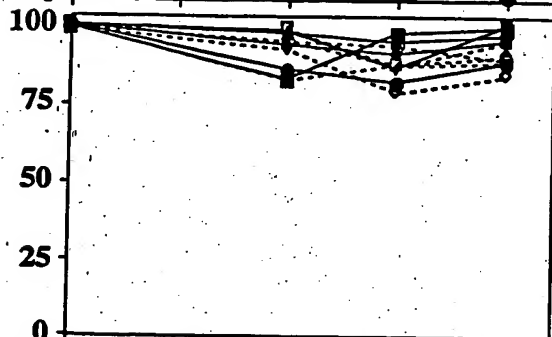


FIG. 33B

$\tau\delta\delta'$

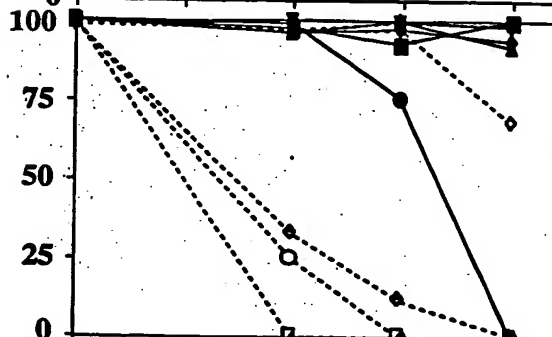


FIG. 33C

SSB

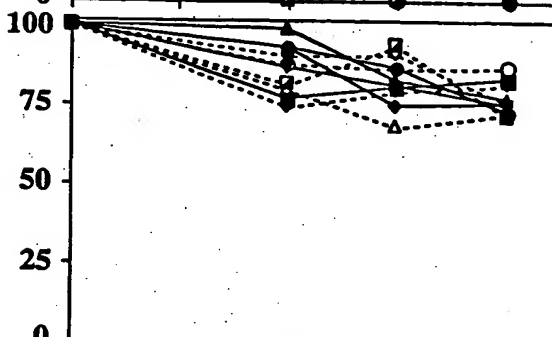


FIG. 33D

Pol III*

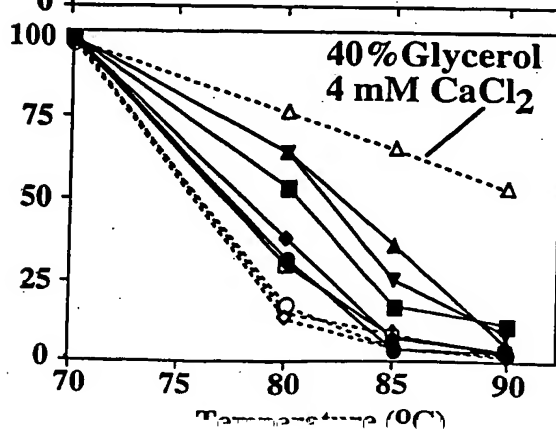


FIG. 33E

ATGAGTAAGGATTTTCGTCCACCTTCACCTGCACACCCAGTTCTCACTCCT	
GGACGGGGCTATAAAGATAGACGAGCTCGTGAAAAGGCAAAGGAGTATG	100
GATACAAAGCTGTCGGAATGTCAGACCACGGAAACCTCTTCGGTTCGTAT	110
AAATTCTACAAAGCCCTGAAGGCGGAAGGAATTAAGCCCATAATCGGCAT	200
GGAAGCCTACTTTACCACGGGTTTCGAGGTTTGACAGAAAGACTAAACGA	
GCGAGGACAACATAACCGACAAGTACAACCACCACCTCATACTTATAGCA	300
AAGGACGAAAAGGTCTAAAGAACTTAATGAAGCTCTCAACCCTCGCCTAC	
AAAGAAGGTTTTTACTACAAACCCAGAATTGATTACGAACTCCTTGAAAA	400
GTACGGGGAGGGCCTAATAGCCCTTACCGCATGCCTGAAAGGTGTTCCCA	
CCTACTACGCTTCTATAAACGAAGTGAAAAAGGCGGAGGAATGGGTAAAG	500
AAGTTCAAGGATATATTTCGGAGATGACCTTTATTTAGAACTTCAAGCGAA	
CAACATTCCAGAACAGGAAGTGGCAAACAGGAACTTAATAGAGATAGCCA	600
AAAAGTACGATGTGAAACTCATAGCGACGCAGGACGCCACTACCTCAAT	
CCCGAAGACAGGTACGCCCACACGGTTCCTATGGCACTTCAAATGAAAAA	700
GACCATTACGAACTGAGTTCGGGAAACTTCAAGTGTTCAAACGAAGACC	
TTCACTTTGCTCCACCCGAGTACATGTGGAAAAAGTTTGAAGGTAAGTTC	800
GAAGGCTGGGAAAAGGCACTCCTGAACACTCTCGAGGTAATGGAAAAGAC	
AGCGGACAGCTTTGAGATATTTGAAAACCTCCACCTACCTCCTTCCCAAGT	900
ACGACGTTCCGCCCGACAAAACCTTGAGGAATACTCAGAGAACTCGCG	
TACAAAGGTTTAAGACAGAGGATAGAAAGGGGACAAGCTAAGGATACTAA	1000
AGAGTACTGGGAGAGGCTCGAGTACGAACTGGAAGTTATAAACAAAATGG	
GCTTTGCGGGATACTTCTTGATAGTTCAGGACTTCATAAACTGGGCTAAG	1100
AAAAACGACATACCTGTTGGACCCCGGAAGGGGAAGTGCTGGAGGTTCCCT	
CGTCGCATACGCCATCGGAATAACGGACGTTGACCCTATAAAGCACGGAT	1200
TCCTTTTTTGAGAGGTTCTTAAACCCCGAAAGGGTTTCCATGCCGGATATA	
GACGTGGATTTCTGTCAGGACAACAGGGAAAAGGTCATAGAGTACGTAAG	1300
GAACAAGTACGGACACGACAACGTAGCTCAGATAATCACCTACAACGTAA	
TGAAGGCGAAGCAAACACTGAGAGACGTGCAAGGGCCATGGGACTCCCC	1400
TACTCCACCGCGGACAAACTCGCAAAACTCATTCTCAGGGGGACGTTCA	
GGGAACGTGGCTCAGTCTGGAAGAGATGTACAAAACGCCTGTGGAGGAAC	1500
TCCTTCAGAAGTACGGAGAACACAGAACGGACATAGAGGACAACGTAAAG	
AAGTTCAGACAGATATGCGAAGAAAGTCCGGAGATAAAACAGCTCGTTGA	1600
GACGGCCCTGAAGCTTGAAGGTCTCACGAGACACACCTCCCTCCACGCCG	
CGGGAGTGGTTATAGCACCAAAGCCCTTGAGCGAGCTCGTTCCCTCTAC	1700
TACGATAAAGAGGGCGAAGTCGCAACCCAGTACGACATGGTTTCACTCGA	
AGAACTCGGTCTCCTGAAGATGGACTTCCTCGGACTCAAACCCCTCACAG	1800
AACTGAACTCATGAAAGAACTCATAAAGGAAAGACACGGAGTGGATATA	
AACTTCCTTGAACCTTCCCCTTGACGACCCGAAAGTTTACAACTCCTTCA	1900
GGAAGGAAAAACACGGGAGTGTTCCAGCTCGAAAGCAGGGGAATGAAAG	
AACTCCTGAAGAACTAAAGCCCGACAGCTTTGACGACATCGTTGCGGTC	2000
CTCGCACTCTACAGACCCGGACCTCTAAAGAGCGGACTCGTTGACACATA	
CATTAAGAGAAAGCACGGAAAAGAACCCGTTGAGTACCCCTTCCCGGAGC	2100
TTGAACCCGTCTTAAAGGAAACCTACGGAGTAATCGTTTATCAGGAACAG	
GTGATGAAGATGTCTCAGATACTTTCCGGCTTTACTCCCGGAGAGGCGGA	2200
TACCCTCAGAAAGGCGATAGGTAAGAAGAAAGCGGATTTAATGGCTCAGA	
TGAAAGACAAGTTCATACAGGGAGCGGTGGAAGGGGATACCCTGAAGAA	2300
AAGATAAGGAAGCTCTGGGAAGACATAGAGAAGTTTCGCTTCTACTCCTT	
CAACAAGTCTCACTCGGTAGCTTACGGGTACATCTCCTACTGGACCGCCT	2400

FIG. 34A

ACGTTAAAGCCCACTATCCCGCGGAGTTCTTCGCGGTAAAACTCACAAC	
GAAAAGAACGACAACAAGTTCCTCAACCTCATAAAAGACGCTAAACTCTT	2500
CGGATTTGAGATACTTCCCCCGACATAAACAAGAGTGATGTAGGATTTA	
CGATAGAAGGTGAAAACAGGATAAGGTTCTGGGCTTGCGAGGATAAAGGGA	2600
GTGGGAGAGGAACTGCTAAGATAATCGTTGAAGCTAGAAAGAAGTATAA	
GCAGTTCAAAGGGCTTGCGGACTTCATAAACAAAACCAAGAACAGGAAGA	2700
TAAACAAGAAAGTCGTGGAAGCACTCGTAAAGGCAGGGGCTTTTGACTTT	
ACTAAGAAAAAGAGGAAAGAACTACTCGCTAAAGTGGCAAACCTCTGAAAA	2800
AGCATTAATGGCTACACAAAACCTCCCTTTTCGGTGCACCGAAAGAAGAAG	
TGGAAGAACTCGACCCCTTAAAGCTTGAAAAGGAAGTTCTCGGTTTTTAC	2900
ATTTTCAGGGCACCCCTTGACAACCTACGAAAAGCTCCTCAAGAACCGCTA	
CACACCCATTGAAGATTTAGAAGAGTGGGACAAGGAAAGCGAAGCGGTGC	3000
TTACAGGAGTTATCACGGAACCTCAAAGTAAAAAAGACGAAAAACGGAGAT	
TACATGGCGGTCTTCAACCTCGTTGACAAGACGGGACTAATAGAGTGTGT	3100
CGTCTTCCCGGGAGTTTACGAAGAGGCAAAGGAACTGATAGAAGAGGACA	
GAGTAGTGGTAGTCAAAGGTTTTCTGGACGAGGACCTTGAAACGGAAAAT	3200
GTCAAGTTCGTGGTGAAAGAGGTTTTCTCCCCTGAGGAGTTCGCAAAGGA	
GATGAGGAATACCCTTTATATATTCTTAAAAAGAGAGCAAGCCCTAAACG	3300
GCGTTGCCGAAAAACTAAAGGGAATTATTGAAAACAACAGGACGGAGGAC	
GGATACAACCTTGGTTCTCACGGTTGATCTGGGAGACTACTTCGTTGATTT	3400
AGCACTCCCACAAGATATGAACTAAAGGCTGACAGAAAGGTTGTAGAGG	
AGATAGAAAAACTGGGAGTGAAGGTCATAATTTAGTAAATAACCCTTACT	3500
TCCGAGTAGTCCCC	

FIG. 34B

MSKDFVHLHLHTQFSLLDGAIKIDELVKKAKEYGYKAVGMSDHGNLFGSY	100
KFYKALKAEIGKPIIGMEAYFTTGSRFDRKTKTSEDNITDKYNHHLILIA	
KDDKGLKNLMLKSTLAYKEGFYKPRIDYELLEKYGEGLIALTACLKGV	200
TYYASINEVKKAEWVKKFKDIFGDDLYLELQANNIPEQEVANRNLI	
KKYDVKLIATQDAHYLNPEDRYAHTVLMALQMKKTIHELSSGNFKCSNED	300
LHFAPPEYMWKKFEGKFEGWEKALLNTLEVMEKTADSFEIFENSTYLLPK	
YDVPPDKTLEEYLRELAYKGLRQRIERGQAKDTKEYWERLEYELEVINKM	400
GFAGYFLIVQDFINWAKKNDIPVGPGRGSAGGSLVAYAIGITDVPDIKHG	
FLFERFLNPERVSMPPDIDVDFCQDNREKVIEWVRNKYGHDNVAQIITYNV	500
MKAKQTLRDVARAMGLPYSTADKLAKLIPOGDVQGTWLSLEEMYKTPVEE	
LLQKYGEHRTDIEDNVKKFRQICEESPEIKQLVETALKLEGLTRHTSLHA	600
AGVVIAPKPLSELVPLYDKEGEVATQYDMVQLEELGLLKMDFLGLKTLT	
ELKLMKELIKERHGV DINFLELPLDDPKVYKLLQEGKTTGVFQLESRGMK	700
ELLKKLKPDSFDDIVAVLALYRPGPLKSGLVDTYIKRKHGKEPVEYPFPE	
LEPVLKETYGIVIVYQEQVMKMSQILSGFTPGEADTLRKAIGKKKADLMAQ	800
MKDKFIOGAVERGYPEEKIRKLWEDIEKFASYSFNKSHSVAYGYISYWTA	
YVKAHYPAEFFAVKLTTEKNDNKFLNLIKDAKLFGFEILPPDINKSDVGF	900
TIEGENRIRFGLARIKGVGEETAKIIVEARKKYKQFKGLADFINKTKNRK	
INKKVVEALVKAGAFDFTKKKRKELLAKVANSEKALMATQNSLFGAPKEE	1000
VEELDPLKLEKEVLGFYISGHPLDNYEKLLKNRYTPIEDLEEWKKESEAV	
LTGVITELKVKKTKNGDYMAVFNLVDKTGLIECVVFPGVYEEAKELIEED	1100
RVVVVKGFLEDELETENVKFVVEVFSPEEFAKEMRNTLYIFLKREQALN	
GVAEKLKGIENNRTEDGYNLVLTVDLGDFVDLALPQDMKLKADRKVVE	1161
EIEKLGVKVII	

FIG. 35

ATGAACTACGTTCCCTTCGCGAGAAAGTACAGACCGAAATTCTTCAGGGA	
AGTAATAGGACAGGAAGCTCCCGTAAGGATACTCAAAAACGCTATAAAAA	100
ACGACAGAGTGGCTCACGCCTACCTCTTTGCCGGACCGAGGGGGGTTGGG	
AAGACGACTATTGCAAGAATTCTCGCAAAAGCTTTGAACTGTAAAAATCC	200
CTCCAAAGGTGAGCCCTGCGGTGAGTGCGAAAAGTGCAGGGAGATAGACA	
GGGGTGTGTTCCCTGACTTAATTGAAATGGATGCCGCCTCAAACAGGGGT	300
ATAGACGACGTAAGGGCATTAAAAGAAGCGGTCAATTACAAACCTATAAA	
AGGAAAGTACAAGGTTTACATAATAGACGAAGCTCACATGCTCACGAAAG	400
AAGCTTTTCAACGCTCTCTTAAAAACCCTCGAAGAGCCCCCTCCAGAACT	
GTTTTTCGTCTTTGTACCACGGAGTACGACAAAATTCTTCCACGATACT	500
CTCAAGGTGTGAGAGGATAATCTTCTCAAAGGTAAGAAAGGAAAAAGTAA	
TAGAGTATCTAAAAAGATATGTGAAAAGGAAGGGATTGAGTGCGAAGAG	600
GGAGCCCTTGAGGTTCTGGCTCATGCCTCTGAAGGGTGCATGAGGGATGC	
AGCCTCTCTCCTGGACCAGGCGAGCGTTTACGGGGAAGGCAGGGTAACAA	700
AAGAAGTAGTGGAGAAGTTCTCCTCGGAATTCTCAGTCAGGAAAGCGTTAGG	
AGTTTTCTGAAATTGCTTCTGAACTCAGAAGTGGACGAAGCTATAAAGTT	800
CCTCAGAGAAGTCTCAGAAAAGGGCTACAACCTGACCAAGTTTTGGGAGA	
TGTTAGAAGAGGAAGTGAGAAACGCAATTTTAGTAAAGAGCCTGAAAAAT	900
CCCGAAAGCGTGGTTCAGAACTGGCAGGATTACGAAGACTTCAAAGACTA	
CCCTCTGGAAGCCCTCCTCTACGTTGAGAACCTGATAAACAGGGGTAAAG	1000
TTGAAGCGAGAACGAGAGAACCCTTAAGAGCCTTTGAACTCGCGGTAAATA	
AAGAGCCTTATAGTCAAAGACATAATTCCCGTATCCCAGCTCGGAAGTGT	1100
GGTAAAGGAAACCAAAAAGGAAGAAAAGAAAGTTGAAGTAAAAGAAGAGC	
CAAAAGTAAAAGAAGAAAAACCAAAGGAGCAGGAAGAGGACAGGTTCCAG	1200
AAAGTTTTAAACGCTGTGGACGGCAAAATCCTTAAAAGAATACTTGAAGG	
GGCAAAAAGGGAAGAAAGAGACGGAAAAATCGTCCTAAAGATAGAAGCCT	1300
CTTATCTGAGAACCATGAAAAAGGAATTTGACTCACTAAAGGAGACTTTT	
CCTTTTTTTAGAGTTTGAACCCGTGGAGGATAAAAAAAACCTCAGAAGTC	1400
CAGCGGGACGAGGCTGTTTTAAAGGTAAAGGAGCTCTTCAATGCAAAAAT	
ACTCAAAGTACGAAGTAAAAGCTAAGGTATAAAGGTGAGAATGCCCGTG	1500
GAAGAGATAGGGCTGTTTAACGCACTAATAGACGGCTTGCCAGGTACGC	
ACTCACGAGGACGAAGGAAAAGGGAAAGGGAGAAGTTTTCGTTTTAGCGA	1600
CTCCTTATAAAGTCAAGGAATTGATGGAAGCTATGGAGGGTATGAAAAAA	
CACATAAAGGATTTAGAAATCCTCGGAGAGACGGATGAGGATTTAACTTT	1700
TTAAAGTATGGGTGTATCTGAGCAAAGGTTTAAAGCTAAAAACAAACCTGA	
AACCCGCAGGGGACCAGCCGAAAGCCATAAAAAAACTCCTTGAAAACCTA	1800
AGGAAAGGCGTAAAAGAACAACACTTCTCGGAGTCACGGGAAGCGGAAA	
GACTTTTACTCTAGCAAACGTAATAGCGAAGTACAACAAACCAACTCTTG	1900
TGGTAGTTCACAACAAAATTCTCGCGGCACAGCTATACAGGGAGTTTAAA	
GAACTATTCCCTGAAAACGCTGTAGAGTACTTTGTCTCTTACTACGACTA	2000
TTACCAACCTGAAGCCTACATTCCTGAAAAAGATTTATACATAGAAAAGG	
ACGCGAGTATAAACGAAAGCTGGAACGTTTCAGACACTCCGCCACGATAT	2100
CCGTTCTAGAAAGGAGGGACGTTATAGTAGTTGCTTCAGTTTCTTGATA	
TACGGACTCGGGAAACCTGAGCACTACGAAAACCTGAGGATAAACTCCA	2200
AAGGGGAATAAGACTGAACTTGAGTAAGCTCCTGAGGAAACTCGTTGAGC	
TAGGATATCAGAGAAATGACTTTGCCATAAAGAGGGCTACCTTCTCGGTT	2300
AGGGGAGACGTGGTTGAGATAGTCCCTTCTCACACGGAAGATTACCTCGT	
GAGGGTAGAGTTCTGGGACGACGAAGTTGAAAGAATAGTCCTCATGGACG	2400
CTCTGAAC	

FIG. 36

MNYVPFARKYRPKFFREVIGQEAPVRILKNAIKNDRVAHAYLFAGPRGVG	
KTTIARILAKALNCKNPSKGEPGECENCREIDRGVFPDLIEMDAASNRG	100
IDDVRLKEAVNYKPIKGKYKVYIIIDEAHMLTKEAFNALLKTLEPPPR	
VFVLCTTEYDKILPTILSRCQRIIFSKVRKEKVIEYLLKICEKEGIECEE	200
GALEVLAHASEGCMRDAASLLDQASVYGEGRVTKEVVENFLGILSQESVR	
SFLKLLLNSEVDEAIKFLRELSEKGYNLTKFWEMLEEEVRNAILVKSLKN	300
PESVVQNWDYEDFKDYPLEALLYVENLINRGKVEARTREPLRAFELAVI	
KSLIVKDIIPVSQLGSSVKETKKEEKKVEVKEEPKVKEEKPKEQEEDRFQ	400
KVLNAVDGKILKRILEGAKREERDGIIVLKIEASYLRTMKKEFDSLKETF	
PFLEFEPVEDKKKPQKSSGTRLF	473

FIG. 37

ATGCGCGTTAAGGTGGACAGGGAGGAGCTTGAAGAGGTTCTTAAAAAAGC	
AAGAGAAAGCACGGAAAAAAAGCCGCACTCCCGATACTCGCGAACTTCT	100
TACTCTCCGCAAAAGAGGAAAACTTAATCGTAAGGGCAACGGACTTGGA	
AACTACCTTGTAAGTCTCCGTAAAGGGGGAGGTTGAAGAGGAAGGAGAGGT	200
TTGCGTCCACTCTCAAAAACTCTACGATATAGTCAAGAACTTAAATTCCG	
CTTACGTTTACCTTCATACGGAAGGTGAAAACTCGTCATAACGGGAGGA	300
AAGAGTACGTACAACTTCCGACAGCTCCCGCGGAGGACTTTCCCGAATT	
TCCAGAAATCGTAGAAGGAGGAGAAACACTTTTCGGGAAACCTTCTCGTTA	400
ACGGAATAGAAAAGGTAGAGTACGCCATAGCGAAGGAAGAAGCGAACATA	
GCCCTTCAGGGAATGTATCTGAGAGGATACGAGGACAGAATTCACTTTGT	500
GTTTCGGACGGTCACAGGCTTGCACTTTATGAACCTCTACGTAAACATTGA	
AAAGAGTGAAGACGAGTCTTTTGCTTACTTCTCCACTCCCGAGTGGAAC	600
TCGCCGTTAGCTCCTGGAAGGAGAATTCCCGGACTACATGAGTGTATCC	
CTGAGGAGTTTTTCGGCGGAAGTCTTGTTTGAGACAGAGGAAGTCTTAAAG	700
GTTTTAAAGAGGTTGAAGGCTTTAAGCGAAGGAAAAGTTTTTCCCGTGAA	
GATTACCTTAAGCGAAAACCTTGCCATCTTTGAGTTCGCGGATCCGGAGT	800
TCGGAGAAGCGAGAGAGGAAATTGAAGTGGAGTACACGGGAGAGCCCTTT	
GAGATAGGATTCAACGGAAATACCTTATGGAGGCGCTTGACGCCTACGAC	900
AGCGAAAGAGTGTGGTTCAAGTTCACAACCCCGACACGGCCACTTTATT	
GGAGGCTGAAGATTACGAAAAGGAACCTTACAAGTGCATAATAATGCCGA	1000
TGAGGGTGTAGCCATGAAAAAGCTTTAATCTTTTTATTGAGCTTGAGCC	
TTTTAATTCTGCGTTTAGCGAAGCCAAACCCAAGTCTTC	1090

FIG. 38

MRVKVDREELEEVLLKKARESTEKKAALPILANFLLSAKEENLIVRATDLE	
NYLVVSVKGEVEEEGEVVCVHSQKLYDIVKNLNSAYVYLHTEGEKLVITGG	100
KSTYKLPTAPAEDFPEFPEIVEGGETLSGNLLVNGIEKVEYAIKEEANI	
ALQGMYLRGYEDRIHFVGS DGHRLALYEPLGEFSKELLI PRKSLKVLKKL	200
ITGIEDVNIKESEDES FAYFSTPEWKLA VRLLEGEFPDYMSVIPEEFSAE	
VLFETEEVLKVLKRLKALSEGKVFPVKITLSENLAIFEADPEFGEAREE	300
IEVEYTGEPFEIGFNGKYLMEALDAYDSERVWFKFTTPDTATLLEAEDYE	
KEPYKCIIMPMRV	363

FIG. 39

GTGGAAACCACAATATTCCAGTTCCAGAAAACTTTTTTCACAAAACCTCC	
GAAGGAGAGGGTCTTCGTCCTTCATGGAGAAGAGCAGTATCTCATAAGAA	100
CCTTTTTGTCTAAGCTGAAGGAAAAGTACGGGGAGAATTACACGGTTCTG	
TGGGGGGATGAGATAAGCGAGGAGGAATTCTACACTGCCCTTCCGAGAC	200
CAGTATATTCGGCGGTTCAAAGGAAAAAGCGGTGGTCATTTACAACTTCG	
GGGATTTCTGAAGAAGCTCGGAAGGAAGAAAAAGGAAAAAGAAAGGCTT	300
ATAAAAGTCCTCAGAAACGTAAAGAGTAACTACGTATTTATAGTGTACGA	
TGCGAAACTCCAGAAACAGGAACTTCTTCGGAACCTCTGAAATCCGTAG	400
CGTCTTTCGGCGGTATAGTGGTAGCAAACAGGCTGAGCAAGGAGAGGATA	
AAACAGCTCGTCCCTAAGAAGTTCAAAGAAAAAGGGATAAACGTAGAAAA	500
CGATGCCCTTGAATACCTTCTCCAGCTCACGGGTTACAACTTGATGGAGC	
TCAAACCTTGAGGTTGAAAAACTGATAGATTACGCAAGTGAAAAGAAAATT	600
TTAACTACTCGATGAGGTAAAGAGAGTAGCCTTCTCAGTCTCAGAAAACGT	
AAACGTATTTGAGTTCGTTGATTTACTCCTCTTAAAAGATTACGAAAAGG	700
CTCTTAAAGTTTTGGACTCCCTCATTTCTTCGGAATACACCCCTCCAG	
ATTATGAAAATCCTGTCTCCTATGCTCTAAAACCTTACACCCTCAAGAG	800
GCTTGAAGAGAAGGGAGAGGACCTGAATAAGGCGATGGAAAGCGTGGGAA	
TAAAGAACAACCTTCTCAAGATGAAGTTCAAATCTTACTTAAAGGCAAAC	900
TCTAAAGAGGACTTGAAGAACCTAATCCTCTCCCTCCAGAGGATAGACGC	
TTTTTCTAAAACCTTACTTTCAGGACACAGTGCAGTTGCTGGGGATTTCTT	1000
GACCTCAAGACTGGAGAGGGAAGTTGTGAAAAATACTTCTCATGGTGGAT	
AATCTTTTTTATGAAGTTTGCGGTTTGCCTTTTTCCCGGTTCT	1093

FIG. 40

VETTIFQFQKTFFTKPPKERVFLHGEEQYLIRTFLSKLKEKYGENYTVL	
WGDEISEEEFYTALSETSI FGGSKEKAVVIYNFGDFLKKLGRKKKEKERL	100
IKVLRNVKSNYVFIVYDAKLQKQELSSSEPLKSVASF GGIVVANRLSKERI	
KQLVLKKFKEKGINVENDALEYLLQLTGYNLMELKLEVEKLIDYASEKKI	200
LTLDEVKRVAFSVSENVNVFEFVDLLLLLDYKALKVLDLSLISFGIHPLO	
IMKILSSYALKLYTLKRLEEKGEDLNKAMESVGIKNNFLKMKFKSYLKAN	300
SKEDLKNLILSLQRIDAFSKLYFQDTVQLLRDFLTSLRLEREVVKNTSHGG	

FIG. 41

ATGGAAAAAGTTTTTTTGGAAAACTCCAGAAAACCTTGACATACCCGG	
AGGACTCCTTTTTTACGGCAAAGAAGGAAGCGGAAAGACGAAAACAGCTT	100
TTGAATTGCAAAAGGTATTTTATGTAAGGAAAACGTACCTGGGGATGCG	
GAAGTTGTCCTCCTGCAACACGTAAACGAGCTGGAGGAAGCCTTCTTT	200
AAAGGAGAAATAGAAGACTTTAAAGTTTATAAGACAAGGACGGTAAAAAG	
CACTTCGTTTACCTTATGGGCGAACATCCCGACTTTGTGGTAATAATCCC	300
GAGCGGACATTACATAAAGATAGAACAGATAAGGGAAGTTAAGAACTTTG	
CCTATGTGAAGCCCGCACTAAGCAGGAGAAAAGTAATTATAATAGACGAC	400
GCCCACGCGATGACCTCTCAGGCGGCAAACGCTCTTTTAAAGGTATTGGA	
AGAGCCACCTGCGGACACCACCTTTATCTTGACCACGAACAGGCGTTCTG	500
CAATCCTGCCGACTATCCTCTCCAGAACTTTTCAAGTGGAGTTCAAGGGC	
TTTTCAGTAAAAGAGGTTATGGAAATAGCGAAAGTAGACGAGGAAATAGC	600
GAAACTCTCTGGAGGCAGTCTAAAAAGGGCTATCTTACTAAAGGAAAACA	
AAGATATCCTAAACAAAGTAAAGGAATTCTTGGAACGAGCCGTTAAAA	700
GTTTACAAGCTTGCAAGTGAATTCGAAAAGTGGGAACCTGAAAAGCAAAA	
ACTCTTCCTTGAAATTATGGAAGAATTGGTATCTCAAAAATTGACCGAAG	800
AGAAAAAAGACAATTACACCTACCTTCTTGATACGATCAGACTCTTTAAA	
GACGGACTCGCAAGGGGTGTAAACGAACCTCTGTGGCTGTTTACGTTAGC	900
CGTTCAGGCGGATTAATAAACCGTTATTGATTCCGTAACATTTAAACCTT	
AATCTAAATTATGAGAGCCTTTGAAGGAGGTCTGGTATGGAAAATTTGAA	1000
GATTAGATATATAGATACGAGGAAGATAGGAACCGTGAGCGGTGTAAAAG	
T	1051

FIG. 42

MEKVFLEKLQKTLHIPGGLLFYKGESGKTKTAFEFAKGILCKENVPWGC	
GSCPSCKHVNELEEAFFKGEIEDFKVYKDKDGKKHFVYLMGEHPDFVVI	100
PSGHYIKIEQIREVKNFAYVKPALSRKVIIIDDAHAMTSQAANALLKVL	
EEPPADTTFILTTNRRSAILPTILSRTFQVEFKGFSVKEVMEIAKVDEEI	200
AKLSGGSLLKRAILLKENKDILNKVKEFLENEPLKVYKLASEFEKWEPEKQ	
KLFLEIMEELVSQKLTEEEKDNYTYLLDTIRLFKDGLARGVNEPLWLFTL	300
AVQAD	

FIG. 43

ATGAACTTCCTGAAAAAGTTCCTTTTACTGAGAAAAGCTCAAAGTCTCC	
TTACTTCGAAGAGTTCTACGAAGAAATCGATTTGAACCAGAAGGTGAAAG	100
ATGCAAGGTTTGTAGTTTTTACTGCGAAGCCACAGAACTCGACGTAAAG	
AAGGCAAACTCCTTTCAATAGGTGCGGTTGAGGTAAAAACCTGGAAAT	200
AGACCTCTCTAAATCTTTTTACGAGATACTCAAAGTGACGAGATAAAGG	
CGGCGGAGATACATGGAATAACCAGGGAAGACGTTGAAAAGTACGGAAAG	300
GAACCAAAGGAAGTAATATACGACTTTCTGAAGTACATAAAGGGAAGCGT	
TCTCGTTGGCTACTACGTGAAGTTTGACGTCTCACTCGTTGAGAAGTACT	400
CCATAAAGTACTTCCAGTATCCAATCATCAACTACAAGTTAGACCTGTTT	
AGTTTCGTGAAGAGAGAGTACCAGAGTGGCAGGAGTCTTGACGACCTTAT	500
GAAGGAACTCGGTGTAGAAATAAGGGCAAGGCACAACGCCCTTGAAGATG	
CCTACATAACCGCTCTTCTTTTCTAAAGTACGTTTACCCGAACAGGGAG	600
TACAGACTAAAGGATCTCCCGATTTTCCTT	

FIG. 44

MNFLKKFLLLRKAQKSPYFEEFYEEIDLNQKVKDARFVVFDCATELQVK	
KAKLLSIGAVEVKNLEIDLKSFYEILKSDEIKAAEIHGITREDVEKYGK	100
EPKEVIYDFLKYIKGSVLVGYYVKFDVSLVEKYSIKYFQYPIINYKLDLF	
SFVKREYQSGRSLDDLMKELGVEIRARHNALEDAYITALLFLKYVYPNRE	200
YRLKDLPIFL	

FIG. 45

ATGCTCAATAAGGTTTTTATAATAGGAAGACTTACGGGTGACCCCGTTAT
 AACTTATCTACCGAGCGGAACGCCCGTAGTAGAGTTTACTCTGGCTTACA 100
 ACAGAAGGTATAAAAACCAGAACGGTGAATTTACAGGAGGAAAGTCACTTC
 TTTGACGTAAAGGCGTACGGAAAAATGGCTGAAGACTGGGCTACACGCTT 200
 CTCGAAAGGATACCTCGTACTCGTAGAGGGAAGACTCTCCAGGAAAAGT
 GGGAGAAAGAAGGAAAGAAGTTCTCAAAGGTCAGGATAATAGCGGAAAAC 300
 GTAAGATTAATAAACAGGCCGAAAGGTGCTGAACTTCAAGCAGAAGAAGA
 GGAGGAAGTTCCTCCCATTGAGGAGGAAATTGAAAACTCGGTAAAGAGG 400
 AAGAGAAGCCTTTTACCGATGAAGAGGACGAAATACCTTTTTAATTTGA
 GGAGGTAAAGTATGGTAGTGAGAGCTCCTAAGAAGAAAGTTTGTATGTA 500
 CTGTGAACAAAAGAGAGAGCCAGATT

FIG. 46

MLNKVFIIGRLTGDPVITYLPSGTPVVEFTLAYNRRYKNQNGEFQEESHF
 FDVKAYGKMAEDWATRFSGYLVLEGRLSQEKWEKEGKKFSKVRIIAEN 100
 VRLINRPKGAELOAEIEEEVPPIEEEIEKLGKEEEKPFTDEEDEIPF

FIG. 47

ATGCAATTTGTGGATAAACTTCCCTGTGACGAATCCGCCGAGAGGGCGGT	
TCTTGGCAGTATGCTTGAAGACCCCGAAAACATACCTCTGGTACTTGAAT	100
ACCTTAAAGAAGAAGACTTCTGCATAGACGAGCACAAGCTACTTTTCAGG	
GTTCTTACAAACCTCTGGTCCGAGTACGGCAATAAGCTCGATTTCGTATT	200
AATAAAGGATCACCTTGAAGAAGAAAACCTTACTCCAGAAAATACCTATAG	
ACTGGCTCGAAGAACTCTACGAGGAGGCGGTATCCCCTGACACGCTTGAG	300
GAAGTCTGCAAAATAGTAAAACAACGTTCCGCACAGAGGGCGATAATTCA	
ACTCGGTATAGAACTCATTACAAAGGAAAGGAAAACAAAGACTTTCACA	400
CATTAATCGAGGAAGCCCAGAGCAGGATATTTTCCATAGCGGAAAGTGCT	
ACATCTACGCAGTTTACCATGTGAAAGACGTTGCGGAAGAAGTTATAGA	500
ACTCATTTATAAATTCAAAGCTCTGACAGGCTAGTCACGGGACTCCCAA	
GCGGTTTCACGGAACCTCGATCTAAAGACGACGGGATTCCACCCTGGAGAC	600
TTAATAATACTCGCCGCAAGACCCGGTATGGGGAAAACCGCCTTTATGCT	
CTCCATAATCTACAATCTCGCAAAAGACGAGGGAAAACCTCAGCTGTAT	700
TTTCCTTGGAATGAGCAAGGAACAGCTCGTTATGAGACTCCTCTCTATG	
ATGTCGGAGGTCCCACTTTTCAAGATAAGGTCTGGAAGTATATCGAATGA	800
AGATTTAAAGAAGCTTGAAGCAAGCGCAATAGAACTCGCAAAGTACGACA	
TATACCTCGACGACACACCCGCTCTCACTACAACGGATTTAAGGATAAGG	900
GCAAGAAAGCTCAGAAAGGAAAAGGAAGTTGAGTTCGTGGCGGTGGACTA	
CTTGCAACTTCTGAGACCGCCAGTCCGAAAGAGTTCAAGACAGGAGGAAG	1000
TGGCAGAGGTTTCAAGAACTTAAAAGCCCTTGCAAAGGAACTTCACATT	
CCCGTTATGGCACTTGCGCAGCTCTCCCGTGAGGTGAAAAGAGGAGTGA	1100
TAAAAGACCCAGCTTGCGGACCTCAGAGAATCCGGACAGATAGAACAGG	
ACGCAGACCTAATCCTTTTCTCCACAGACCCGAGTACTACAAGAAAAAG	1200
CCAAATCCCGAAGAGCAGGGTATAGCGGAAGTGATAATAGCCAAGCAAAG	
GCAAGGACCCACGGACATTGTGAAGCTCGCATTTATTAAGGAGTACACTA	1300
AGTTTGCAAACCTAGAAGCCCTTCTGAACAACCTCCTGAAGAAGAGGAA	
CTTTCCGAAATTATTGAAACACAGGAGGATGAAGGATTCTGAAGATATTGA	1400
CTTCTGAAAATTAAGGTTTTATAATTTTATCTTGGCTATCCGGGGTAGCT	
CAATCGGCAGAGCGGGTGGCTG	1472

FIG. 48

MQFVDKLPCEDESRAERAVLGSMLEDPENIPLVLEYLKEEDFCIDEHKLLFR	
VLTNLWSEYGNKLDVFLIKDHLEKKNLLQKIPIDWLEELYEEAVSPDTLE	100
EVCKIVKQRSAQRAIIQLGITSTQFYHVKDVAEEVIELIYKFKSSDRLVT	
GLPSGFTELDLKTTFHFGDLIIILARPFGMGKTAFMLSI IYNLAKDEGKP	200
SAVFSLEMSKEQLVMRLLSMMSEVPLFKIRSGSISNEDLKKLEASAIELA	
KYDIYLDTPALTTTDLRIRARKLRKEKEVEFVAVDYLQLLRPPVRKSSR	300
QEEVAEVSRLKALAKELHIPVMALAQLSREVEKRSDKRPQLADLRESGO	
IEQDADLILFLHRPEYYKKPNPEEQGIAEVIIAKQRQGPTDIVKLAFIK	400
EYTKFANLEALPEQPPEEEELSEIIETQEDEGFEDIDF	

FIG. 49

ATGTCCTCGGACATAGACGAACTTAGACGGGAAATAGATATAGTAGACGT	
CATTTCCGAATACTTAACTTAGAGAAGGTAGGTTCCAATTACAGAACGA	100
ACTGTCCCTTTACCCTGACGATACACCCTCCTTTTACGTGTCTCCAAGT	
AAACAAATATTCAAGTGTTTCGGTTGCGGGGTAGGGGAGACGCGATAAA	200
GTTTCGTTTCCCTTTACGAGGACATCTCCTATTTTGAAGCCGCCCTTGAAC	
TCGCAAAACGCTACGGAAGAAATTAGACCTTGAAAAGATATCAAAAGAC	300
GAAAAGGTATACGTGGCTCTTGACAGGGTTTGTGATTTCTACAGGGAAAG	
CCTTCTCAAAAACAGAGAGGCAAGTGAGTACGTAAAGAGTAGGGGAATAG	400
ACCCTAAAGTAGCGAGGAAGTTTGATCTTGGGTACGCACCTTCCAGTGAA	
GCACTCGTAAAAGTCTTAAAAGAGAACGATCTTTTAGAGGCTTACCTTGA	500
AACTAAAAACCTCCTTTCTCCTACGAAGGGTGTTTACAGGGATCTCTTTC	
TTCGGCGTGTCTGTGATCCCGATAAAGGATCCGAGGGGAAGAGTTATAGGT	600
TTCGGTGGAAGGAGGATAGTAGAGGACAAATCTCCAAGTACATAAACTC	
TCCAGACAGCAGGGTATTTAAAAAGGGGGAGAACTTATTCGGTCTTTACG	700
AGGCAAAGGAGTATATAAAGGAAGAAGGATTTGCGATACTTGTGGAAGGG	
TACTTTGACCTTTTGAGACTTTTTTCCGAGGGAATAAGGAACGTTGTTGC	800
ACCCCTCGGTACAGCCCTGACCCAAAATCAGGCAAACCTCCTTTCCAAGT	
TCACAAAAAAGGTCTACATCCTTTACGACGGAGATGATGCGGGAAGAAAG	900
GCTATGAAAAGTGCCATTCCTTACTCCTCAGTGCAGGAGTGGAAGTTTA	
TCCCGTTTACCTCCCCGAAGGATACGATCCCGACGAGTTTATAAAGGAAT	1000
TCGGGAAAGAGGAATTAAGAAGACTGATAAACAGCTCAGGGGAGCTCTTT	
GAAACGCTCATAAAAACCGCAAGGGGAAAACCTTAGAGGAGAAAACGCGTGA	1100
GTTTCAGGTATTATCTGGGCTTTATTTCCGATGGAGTAAGGCGCTTTGCTC	
TGGCTTCGGAGTTTCACACCAAGTACAAAGTTCCTATGGAAATTTTATTA	1200
ATGAAAATTGAAAAAATTCTCAAGAAAAAGAAATTAACTCTCCTTTAA	
GGAAAAAATCTTCTGAAAGGACTGATAGAATTAAAACCAAAAATAGACC	1300
TTGAAGTCTTGAACCTTAAGTCTGAGTTAAAGGAACTCGCAGTTAACGCC	
TTAAACGGAGAGGAGCATTTACTTCCAAAAGAAGTTCTCGAGTACCAGGT	1400
GGATAACTTGGAGAACTTTTTTAACAACATCCTTAGGGATTTACAAAAAT	
CTGGGAAAAAGAGGAAGAAAAGAGGGTTGAAAAATGTAAATACTTAATTA	1500
ACTTTAATAAATTTTATAGAGTTAGGA	

FIG. 50

MSSDIDELRREIDIVDVISEYLNLEKVGSNYRTNCPFHPPDTPSFYVSPS	
KQIFKCFGCGVGDDAIKFVSLYEDISYFEAALELAKRYGKKLDLEKISKD	100
EKVYVALDRVCDFYRESLLKNREASEYVKSRGIDPKVARKFDLGYAPSSE	
ALVKVLKENDLLEAYLETKNLLSPTKGVYRDLFLRRVVIPIKDPRGRVIG	200
FGGRRIVEDKSPKYINSPDSRVFKKGENLFGLYEAKYIKEEGFAILVEG	
YFDLLRLFSEGIRNVVAPLGTALTQNQANLLSKFTKKVYILYDGGDAGRK	300
AMKSAIPLLLSAGVEVYPVYLPEGYDPDEFIKEFGKEELRRLINSSGELE	
ETLIKTAARENLEEKTRFRYYLGFISDGVRRFALASEFHTKYKVPMEILL	400
MKIEKNSQEKEIKLSFKEKIFLKGLIELKPKIDLEVLNLSPELKELAVNA	
LNGEEHLLPKEVLEYQVDNLEKLFNNILRDLQKSGKKRKKRGLKNVNT	498

FIG. 51

ATGCAAGATACCGCTACCTGCAGTATTTGTCAGGGGACGGGATTCGTAAA	
GACCGAAGACAACAAGGTAAGGCTCTGCGAATGCAGGTTCAAGAAAAGGG	100
ATGTAAACAGGGAACTAAACATCCCAAAGAGGTACTGGAACGCCAACTTA	
GACACTTACCACCCCAAGAACGTATCCCAAGAACAGGGCACTTTTGACGAT	200
AAGGGTCTTCGTCCCAACTTCAATCCCGAGGAAGGGAAAGGGCTTACCT	
TTGTAGGATCTCCTGGAGTCGGCAAACTCACCTTGCGGTTGCAACATTA	300
AAAGCGATTTATGAGAAGAAGGGAATCAGAGGATACTTCTTCGATACGAA	
GGATCTAATATTCAGGTTAAAACACTTAATGGACGAGGGAAAGGATACAA	400
AGTTTTTAAAACTGTCTTAAACTCACCGGTTTTGGTTCTCGACGACCTC	
GGTCTGAGAGGCTCAGTGACTGGCAGAGGGAATCATCTCTTACATAAT	500
CACTTACAGGTATAACAACCTTAAGAGCACGATAATAACCACGAATTACT	
CACTCCAGAGGGAAGAAGAGAGTAGCGTGAGGATAAGTGCGGATCTTGCA	600
AGCAGACTCGGAGAAAACGTAGTTTCAAAAATTTACGAGATGAACGAGTT	
GCTCGTTATAAAGGGTTCCGACCTCAGGAAGTCTAAAAGCTATCAACCC	700
CATCT	

FIG. 52

MQDTATCSICQGTGFVKTEDNKNVRLCECRFKKRDVNRELNIPKRYWNANL	
DTYHPKNVSQNRALLTIRVFVHNFNPEEGKGLTFVGSPGVGKTHLAVATL	100
KAIYEKKGIRGYFFDTKDLIFRLKHLMDGKDTKFLKTVLNSPVLVLDL	
GSERLSDWQRELISYIITYRYNNLKSTIITTNYSLOREEESSVRISADLA	200
SRLGENVVSKIYEMNELLVIKGSDLRKS KKLSTPS	

FIG. 53

ATGAAAAAGATTGAAAATTTGAAGTGGAAAAATGTCTCGTTTAAAAGCCT	100
GGAAATAGATCCCGATGCAGGTGTGGTTCTCGTTTCCGTGGAAAAATTTCT	
CCGAAGAGATAGAAGACCTTGTGCGTTTACTGGAGAAGAAGACGCGGTTT	200
CGAGTCATCGTGAACGGTGTTCAAAAAAGTAACGGGGATCTAAGGGGAAA	
GATACTTTCCCTTCTCAACGGTAATGTGCCTTACATAAAAGATGTTGTTT	300
TCGAAGGAAACAGGCTGATTCTGAAAGTGCTTGGAGATTTTCGCGCGGGAC	
AGGATCGCCTCCAAACTCAGAAGCACGAAAAACAGCTCGATGAACTGCT	400
GCCTCCCGGAACAGAGATCATGCTGGAGGTGTGGAGCCTCCGGAAGATC	
TTTTGAAAAAGGAAGTACCACAACCAGAAAAGAGAGAAGAACCAGGGT	500
GAAGAATTGAAGATCGAGGATGAAAACCATCTTTGGACAGAAACCCAG	
AAAGATCGTCTTCACCCCTCAAAAATCTTTGAGTACAACAAAAGACAT	600
CGGTGAAGGGCAAGATCTTCAAAATAGAGAAGATCGAGGGGAAAAGAACG	
GTCCTTCTGATTTACCTGACAGACGGAGAAGATTCTCTGATCTGCAAAGT	700
CTTCAACGACGTTGAAAAGGTGGAAGGGAAAGTATCGGTGGGAGACGTGA	
TCGTTGCCACAGGAGACCTCCTTCTCGAAAACGGGGAGCCACCTTTAC	800
GTGAAGGGAATCACAAACTTCCCGAAGCGAAAAGGATGGACAAATCTCC	
GGTTAAGAGGGTGGAGCTCCACGCCCATACCAAGTTCAGCGATCAGGACG	900
CAATAACAGATGTGAACGAATATGTGAAACGAGCCAAGGAATGGGGCTTT	
CCCGCGATAGCCCTCACGGATCATGGGAACGTTTCAGGCCATACCTTACTT	1000
CTACGACGCGCGGAAAGAAGCTGGAATAAAGCCCATTTTTCGGTATCGAAG	
CGTATCTGGTGAGTGACGTGGAGCCCGTCATAAGGAATCTCTCCGACGAT	1100
TCGACGTTTGGAGATGCCACGTTTCGTTCGTCTCGACTTCGAGACGACGGG	
TCTCGACCCGCAGGTGGATGAGATCATCGAGATAGGAGCGGTGAAGATAC	1200
AGGGTGGCCAGATAGTGGACGAGTACCACACTCTCATAAAGCCTTCCAGG	
GAGATCTCAAGAAAAAGTTCGGAGATCACCGGAATCACTCAAGAGATGCT	1300
GGAAAACAAGAGAAGCATCGAGGAAGTTCTGCCGGAGTTCCTCGGTTTTTC	
TGGAAGATTCCATCATCGTAGCACACAACGCCAACTTCGACTACAGATTT	1400
CTGAGGCTGTGGATCAAAAAAGTGATGGGATTGGACTGGGAAAGACCCTA	
CATAGATACGCTCGCCCTCGCAAAGTCCCTTCTCAAAGTGAAGCTACT	1500
CTCTGGATTCCGTTGTGGAAGCTCGGATTGGGTCCCTTCCGGCACCAC	
AGGGCCCTGGATGACGCGAGGGTCACCGCTCAGGTTTTCTCAGGTTCTG	1600
TGAGATGATGAAGAAGATCGGTATCACGAAGCTTTCAGAAATGGAGAAGT	
TGAAGGATACGATAGACTACACGCGTTGAAACCCTTCCACTGCACGATC	1700
CTCGTTCAGAACAAAAAGGGATTGAAAAACCTATACAACTGGTTTTCTGA	
TTCTATATAAAGTACTTCTACGGTGTTCCGAGGATCCTCAAAAGTGAGC	1800
TCATCGAGAACAGAGAAGGACTGCTCGTGGGTAGCGCGTGTATCTCCGGT	
GAGCTCGGACGTGCCGCCCTCGAAGGAGCGAGTGATTTCAGAACTCGAAGA	1900
GATCGCGAAGTTCTACGACTACATAGAAGTCATGCCGCTCGACGTTATAG	
CCGAAGATGAAGAAGACCTAGACAGAGAAAGACTGAAAGAAGTGATCCGA	2000
AAACTCTACAGAATAGCGAAAAAATTGAACAAGTTCGTCGTATGACCGG	
TGATGTTTCATTTCTCGATCCCGAAGATGCCAGGGGCAGAGCTGCACTTC	2100
TGGCACCTCAGGGAAACAGAACTTCGAGAATCAGCCCGCACTCTACCTC	
AGAACGACCGAAGAAATGCTCGAGAAGGCGATAGAGATATTTCGAAGATGA	2200
AGAGATCGCGAGGGAAGTCGTGATAGAGAATCCCAACAGAATAGCCGATA	
TGATCGAGGAAGTGCAGCCGCTCGAGAAAAAATTCACCCGCCGATCATA	2300
GAGAACGCCGATGAAATAGTGAGAAACCTCACCATGAAGCGGGCGTACGA	
GATCTACGGTGATCCGCTTCCCGAAATCGTCCAGAAGCGTGTGAAAAGG	

FIG. 54A

AACTGAACGCCATCATAAATCATGGATACGCCGTTCTCTATCTCATCGCT 2400
 CAGGAGCTCGTTCAGAAATCTATGAGCGATGGTTACGTGGTTGGATCCAG
 AGGATCCGTCGGGTCTTCACTCGTGGCCAATCTCCTCGGAATAACAGAGG 2500
 TGAATCCCCTACCACCACATTACAGGTGTCCAGAGTGCAAATACTTTGAA
 GTTGTCTGAAGACGACAGATACGGAGCGGGTTACGACCTTCCCAACAAGAA 2600
 CTGTCCAAGATGTGGGGCTCCTCTCAGAAAAGACGGCCACGGCATAACCGT
 TTGAAACGTTTCATGGGGTTCGAGGGGTGACAAGGTCCCCGACATAGATCTC 2700
 AACTTCTCAGGAGAGTATCAGGAACGTGCTCATCGTTTTGTGGAAGAACT
 CTTTCGGTAAAGACCACGTCTATAGGGCGGGAACCATAAACACCATCGCGG 2800
 AAAGAAGTGCGGTGGGTACGTGAGAAGCTACGAAGAGAAAACCGGAAAG
 AAGCTCAGAAAGGCGGAAATGGAAAGACTCGTTTTCCATGATCACGGGAGT 2900
 GAAGAGAACGACGGGTACGACCCAGGGGGGCTCATGATCATAACCGAAAG
 ACAAAGAAGTCTACGATTTCACTCCCATACAGTATCCAGCCAACGATAGA 3000
 AACGCAGGTGTGTTCAACACGCACTTCGCATACGAGACGATCCATGATGA
 CCTGGTGAAGATAGATGCGCTCGGCCACGATGATCCCACTTTTCATCAAGA 3100
 TGCTCAAGGACCTCACCGGAATCGATCCCATGACGATTCCTCATGGATGAC
 CCGGATACGCTCGCCATATTCACTTCTGTGAAGCCTCTTGGTGTGGATCC 3200
 CGTTGAGCTGGAAAGCGATGTGGGAACGTACGGAATTCGCGAGTTTCGGAA
 CCGAGTTTGTGAGGGGAATGCTCGTTGAAACGAGACCAAAGAGTTTCGCC 3300
 GAGCTTGTGAGAATCTCAGGACTGTACACGGTACGGACGTCTGGTTGAA
 CAACGCACGTGATTGGATAAACCTCGGCTACGCCAAGCTCTCCGAGGTTA 3400
 TCTCGTGTAGGGACGACATCATGAACTTCCTCATAACAAAGGAATGGAA
 CCGTCACTTGCCTTCAAGATCATGGAAAACGTGAGGAAGGGAAAGGGTAT 3500
 CACAGAAGAGATGGAGAGCGAGATGAGAAGGCTGAAGGTTCCAGAATGGT
 TCATCGAATCCTGTAAAAGGATCAAATATCTCTTCCCGAAAGCTCACGCT 3600
 GTGGCTTACGTGAGTATGGCCTTCAGAATTGCTTACTTCAAGGTTCACTA
 TCCTCTTCAGTTTTACGCGGCGTACTTCACGATAAAAGGTGATCAGTTTCG 3700
 ATCCGGTTCTCGTACTCAGGGGAAAAGAAGCCATAAAGAGGCGCTTGAGA
 GAACTCAAAGCGATGCCTGCCAAAGACGCCCAGAAGAAAAACGAAGTGAG 3800
 TGTTCTGGAGGTTGCCCTGGAAATGATACTGAGAGGTTTTTCTTCTTCTAC
 CGCCCGACATCTTCAAATCCGACGCGAAGAAATTTCTGATAGAAGGAAAC 3900
 TCGCTGAGAATTCGGTCAACAACTTCCAGGACTGGGTGACAGCGTTGC
 CGAGTCGATAATCAGAGCCAGGGAAGAAAAGCCGTTCACTTCGGTGGAAAG 4000
 ATCTCATGAAGAGGACCAAGGTCAACAAAAATCACATAGAGCTGATGAAA
 AGCCTGGGTGTTCTCGGGGACCTTCAGAGACGGAACAGTTCACGCTTTT 4100
 C

FIG. 54B

MKKIENLKWKNVSFKSLEIDPDAGVVLVSVEKFSEEIEDLVRLLEKKTRF	
RVIVNGVQKSNGLRGKILSLLNGNVPYIKDVVFEGNRLILKVLGDFARD	100
RIASKLRSTKKQLDELLPPGTEIMLEVVEPPEDLLKKEVPQPEKREEPKG	
EELKIEDENHIFGQKPRKIVFTPSKIFEYNKKTSVKGKIFKIEKIEGKRT	200
VLLIYLTGDGDSLICKVFNDVEKVEGKVSVDVIVATGDLLLENGEPTLY	
VKGITKLPEAKRMDKSPVKRVELHAHTKFSQDAITDVNEYVKRAKEWGF	300
PAIALTDHGNVQAIPIFYDAAKEAGIKPIFGIEAYLVSDVEPVIRNLSDD	
STFGDATFVVLDFETTGLDPQVDEIIIEIGAVKIQGGQIVDEYHTLIKPSR	400
EISRKSSEITGITQEMLENKRSIEEVLPEFLGFLSDSIIVAHNANFDYRF	
LRLWIKKVMGLDWERPYIDTLALAKSLLKLRSYSLDSVVEKLGFGPFRHH	500
RALDDARVTAQVFLRFVEMMKKIGITKLSEMEKLDKTIDYTALKPFHCTI	
LVQNKKGKLNLYKLVSDSYIKYFYGVPRILKSELINREGLLVGSACISG	600
ELGRAALEGASDSELEEIAKFYDYIEVMPLDVIAEDEEDLDRERLKEVYR	
KLYRIAKKLNKFVMTGVDVHFLDPEDARGRAALLAPQGNRNFNENQPALYL	700
RTTEEMLEKAIEIFEDEEIAREVVIENPNRIADMIEEVQPLEKKLHPPII	
ENADEIVRNLTMKRAYEIIYGDPLPEIVQKRVEKELNAIINHGYAVLYLIA	800
QELVQKSMDSGYVVGSRGSSVSSLVANLLGITEVNPLPPHYRCPECKYFE	
VVEDDRYGAGYDLPNKNCPRCGAPLRKDGHGIPFETFMGFEGDKVPDIDL	900
NFSGEYQERAHRFVEELFGKDHVYRAGTINTIAERSAVGYVRSYEEKTGK	
KLRKAEMERLVSMITGVKRTTGQHPGGLMIIPKDKEYDFTPIQYPANDR	1000
NAGVFTTHFAYETIHDDLVKIDALGHDDPTFIKMLKDLTGIDPMTIPMDD	
PDTLAIFSSVKPLGVDPVELESVDGTYGIPEFGTEFVRGMLVETRPKSFA	1100
ELVRISGLSHGTDVWLNNDWINLGYAKLSEVISCRDDIMNFLIHKGME	
PSLAFKIMENVRKKGKITEEMESEMRRLKVPEWFIESCKRIKYLFPKAHA	1200
VAYVSMAFRIAYFKVHYPLQFYAAYFTIKGDQFDPVLVLRGKEAIKRRLR	
ELKAMPAKDAQKKNEVSVLEVALEMILRGFSFLPPDIFKSDAKKFLIEGN	1300
SLRIPFNKLPGLGDSVAESIIRAREEKPFSTSVEDLMKRTKVKNKHIELMK	
SLGVLGDLPETEQFTLF	1367

FIG. 55

GTGCTCGCCATGATATGGAACGACACCGTTTTTTGCGTCGTAGACACAGA	
AACCACGGGAACCGATCCCTTTGCCGGAGACCGGATAGTTGAAATAGCCG	100
CTGTTCCCTGTCTTCAAGGGGAAGATCTACAGAAACAAAGCGTTTCACTCT	
CTCGTGAATCCCAGAATAAGAATCCCTGCGCTGATTCAGAAAGTTCACGG	200
TATCAGCAACATGGACATCGTGGAAGCGCCAGACATGGACACAGTTTACG	
ATCTTTTCAGGGATTACGTGAAGGGAACGGTGCTCGTGTTTCACAACGCC	300
AACTTCGACCTCACTTTTCTGGATATGATGGCAAAGGAAACGGGAAACTT	
TCCAATAACGAATCCCTACATCGACACACTCGATCTTTCAGAAGAGATCT	400
TTGGAAGGCCTCATTCTCTCAAATGGCTCTCCGAAAGACTTGGAATAAAA	
ACCACGATACGGCACCGTGCTCTTCCAGATGCCCTGGTGACCGCAAGAGT	500
TTTTGTGAAGCTTGTTGAATTTCTTGGTGAAAACAGGGTCAACGAATTCA	
TACGTGGAACCGGGG	567

FIG. 56

MLAMIWNDTVFCVVDTETTGTDPFAGDRIVEIAAVPVFKGKIYRNKAFHS	
LVNPRIRIPALIQKVHGISNMDIVEAPDMDTVYDLFRDYVKGTVLVFHNA	100
NFDLTFLDMMAKETGNFPITNPYIDTLDLSEEIFGRPHSLKWLSERLGIK	
TTIRHRALPDALVTARVVFVKLVEFLGENRVNEFIRGKRG	189

FIG. 57

GTGGAAGTTCTTTACAGGAAGTACAGGCCAAAGACTTTTTCTGAGGTTGT	
CAATCAGGATCATGTGAAGAAGGCAATAATCGGTGCTATT CAGAAGAACA	100
GCGTGGCCACGGATACATATTCGCCGGTCCGAGGGGAACGGGGAAGACT	
ACTCTTGCCAGAATTCTCGCAAATCCCTGAACTGTGAGAACAGAAAGGG	200
AGTTGAACCCTGCAATTCCTGCAGAGCCTGCAGAGAGATAGACGAGGGAA	
CCTTCATGGACGTGATAGAGCTCGACGCGGCCTCCAACAGAGGAATAGAC	300
GAGATCAGAAGAATCAGAGACGCCGTTGGATACAGGCCGATGGAAGGTAA	
ATACAAAGTCTACATAATAGACGAAGTTCACATGCTCACGAAAGAAGCCT	400
TCAACGCGCTCCTCAAAACACTCGAAGAACCTCCTTCCCACGTCGTGTTT	
GTGCTGGCAACGACAAACCTTGAGAAGGTTCTCCCACGATTATCTCGAG	500
ATGTCAGGTTTTCGAGTTCAGAAACATTCCCGACGAGCTCATCGAAAAGA	
GGCTCCAGGAAGTTGCGGAGGCTGAAGGAATAGAGATAGACAGGGAAGCT	600
CTGAGCTTCATCGCAAAAAGAGCCTCTGGAGGCTTGAGAGACGCGCTCAC	
CATGCTCGAGCAGGTGTGGAAGTTCTCGGAAGGAAAGATAGATCTCGAGA	700
CGGTACACAGGGCGCTCGGGTTGATACCGATACAGGTTGTTTCGCGATTAC	
GTGAACGCTATCTTTTCTGGTGATGTGAAAAGGGTCTTCACCGTTCTCGA	800
CGACGTCTATTACAGCGGGAAGGACTACGAGGTGCTCATT CAGGAAGCAG	
TCGAGGATCTGGTCGAAGACCTGGAAGGGAGAGAGGGGTTTACCAGGTT	900
TCAGCGAACGATATAGTTTCAGGTTTCGAGACAACTTCTGAATCTTCTGAG	
AGAGATAAAGTTCGCCGAAGAAAAACGACTCGTCTGTAAAGTGGGTTCCG	1000
CTTACATAGCGACGAGGTTCTCCACCACAAACGTT CAGGAAAACGATGTC	
AGAGAAAAAAACGATAATTCAAATGTACAGCAGAAAAGAAGAGAAGAAAGA	1100
AACGGTGAAGGCAAAAGAAGAAAAACAGGAAGACAGCGAGTTCCGAGAAAC	
GCTTCAAAGAACTCATGGAAGAACTGAAAGAAAAGGGCGATCTCTCTATC	1200
TTTGTGCTCTCAGCCTCTCAGAGGTGCAGTTTGACGGAGAAAAGGTGAT	
TATTTCTTTTGATT CATCGAAAGCTATGCATTACGAGTTGATGAAGAAAA	1300
AACTGCCTGAGCTGGAAAACATTTTTCTAGAAAACCTCGGGAAAAAAGTA	
GAAGTTGAACTTCGACTGATGGGAAAAGAAGAAACAATCGAGAAGGTTTC	1400
TCAGAAGATCCTGAGATTGTTTGAACAGGAGGGA	

FIG. 58

MEVLYRKYPKTFSEVVNQDHVKKAIIGAIQKNSVAHGYIFAGPRGTGKT	
TLARILAKSLNCENRKGVPCNSCRACREIDEGTFMDVIELDAASNRGID	100
EIRRIRDAVGYRPMEGKYKVYIIDEVHMLTKEAFNALLKTLEPPSHVVF	
VLATTNLEKVPPTIISRCQVFEFRNIPDELIEKRLQEVAAEGIEIDREA	200
LSFIAKRASGGLRDALTMLEQVWKFSEGKIDLETVHREALGLIPIQVVRDY	
VNAIFSGDVKRVFTVLDDVYYSGKDYEVLIQEAVEDLVEDLERERGVYQV	300
SANDIVQVSRQLLNLLREIKFAEEKRLVCKVGSAYIATRFSTTNVQENDV	
REKNDNSNVQQKEKKETVKAKEEKQEDSEFEKRFKELMEELKEKGDLSI	400
FVALSLSEVQFDGEKVIISFDSSKAMHYELMKKKLPELENIFSRKLGKKV	
EVELRLMGKEETIEKVSQKILRLFEQEG	478

FIG. 59

ATGAAAGTAACCGTCACGACTCTTGAATTGAAAGACAAAATAACCATCGC	100
CTCAAAGCGCTCGCAAAGAAATCCGTGAAACCCATTCTTGCTGGATTTCT	
TTTTCGAAGTGAAAGATGGAAATTTCTACATCTGCGCGACCGATCTCGAG	200
ACCGGAGTCAAAGCAACCGTGAATGCCGCTGAAATCTCCGGTGAGGCACG	
TTTTGTGGTACCAGGAGATGTCATTGAGAAGATGGTCAAGGTTCTCCCAG	300
ATGAGATAACGGAACCTTTCTTTAGAGGGGGATGCTCTTGTTATAAGTTCT	
GGAAGCACCGTTTTTCAGGATCACCACCATGCCCCGCGGACGAATTTCCAGA	400
GATAACGCCTGCCGAGTCTGGAATAACCTTCGAAGTTGACACTTCGCTCC	
TCGAGGAAATGGTTGAAAAGGTCATCTTCGCCGCTGCCAAAGACGAGTTC	500
ATGCGAAATCTGAATGGAGTTTTCTGGGAACTCCACAAGAATCTTCTCAG	
GCTGGTTGCAAGTGATGGTTTTCAGACTTGCACTTGCTGAAGAGCAGATAG	600
AAAACGAGGAAGAGGGCGAGTTTTCTTGCTCTCTTTGAAGAGCATGAAAGAA	
GTTCAAAACGTGCTGGACAACACAACGGAGCCGACTATAACGGTGAGGTA	700
CGATGGAAGAAGGGTTTTCTCTGTCGACAAATGATGTAGAAACGGTGATGA	
GAGTGGTCGACGCTGAATTTCCCGATTACAAAAGGGTGATCCCCGAAACT	800
TTCAAAACGAAAGTGGTGGTTTCCAGAAAAGAACTCAGGGAATCTTTGAA	
GAGGGTGATGGTGATTGCCAGCAAGGGAAGCGAGTCCGTGAAGTTCGAAA	900
TAGAAGAAAACGTTATGAGACTTGTGAGCAAGAGCCCGATTATGGAGAA	
GTGGTCGATGAAGTTGAAGTTCAAAAAGAAGGGGAAGATCTCGTGATCGC	1000
TTTCAACCCGAAGTTCATCGAGGACGTTTTGAAGCACATTGAGACTGAAG	
AAATCGAAATGAACTTCGTTGATTCTACCAGTCCATGTGAGATAAATCCA	1098
CTCGATATTTCTGGATACCTTTACATAGTGATGCCCATCAGACTGGCA	

FIG. 60

MKVTVTTLLELKDKITIASKALAKKSVKPILAGFLFEVKDGNFYICATDLE	100
TGVKATVNAAEISGEARFVVPGDVIQKMVKVLPDEITELSLEGDALVISS	
GSTVFRITTMPADEFPEITPAESGITFEVDTSLLLEEMVEKVIFAAKDEF	200
MRNLNGVFWELHKNLLRLVASDGFRLALAEQIENEEASFLLSLKSMKE	
VQNVLDNTTEPTITVRYDGRRVSLSTNDVETVMRVVDAEFPDYKRVIPET	300
FKTKVVVSRKELRESLKRVMVIASKGSESVKFEIEENVMLVSKSPDYGE	
VVDEVEVQKEGEDLVIAFNPKFIEDVLKHIETEEIEMNFVDSTSPCQINP	366
LDISGYLYIVMPIRLA	

FIG. 61

ATGCCAGTCACGTTTCTCACAGGTACTGCAGAACTCAGAAGGAAGAATT	
GATAAAGAACTCCTGAAGGATGGTAACGTGGAGTACATAAGGATCCATC	100
CGGAGGATCCCGACAAGATCGATTTTCATAAGGTCTTTACTCAGGACAAAG	
ACGATCTTTTCCAACAAGACGATCATTGACATCGTCAATTTTCGATGAGTG	200
GAAAGCACAGGAGCAGAAGCGTCTCGTTGAACTTTTGAAAAACGTACCGG	
AAGACGTTTCATATCTTCATCCGTTCTCAAAAAACAGGTGGAAAGGGAGTA	300
GCGCTGGAGCTTCCGAAGCCATGGGAAACGGACAAGTGGCTTGAGTGGAT	
AGAAAAGCGCTTCAGGGAGAATGGTTTGCTCATCGATAAAGATGCCCTTC	400
AGCTGTTTTTCTCCAAGGTTGGAACGAACGACCTGATCATAGAAAGGGAG	
ATTGAAAAACTGAAAGCTTATTCCGAGGACAGAAAGATAACGGTAGAAGA	500
CGTGGAAGAGGTCGTTTTTACCTATCAGACTCCGGGATACGATGATTTTT	
GCTTTGCTGTTTCCGAAGGAAAAAGGAAGCTCGCTCACTCTCTTCTGTCTG	600
CAGCTGTGGA AAAACCAAGAGTCCGTGGTGATTGCCACTGTCCTTGCGAA	
TCACTTCTTGATCTCTTCAAAATCCTCGTTCTTG TGACAAAGAAAAGAT	700
ACTACACCTGGCCTGATGTGTCCAGGGTGTCCAAAGAGCTGGGAATTCCC	
GTTCTCGTGTGGCTCGTTTCCTCGGTTTCTCCTTTAAGACCTGGAAATT	800
CAAGGTGATGAACCACTCCTCTACTACGATGTGAAGAAGGTTAGAAAGA	
TACTGAGGGATCTCTACGATCTGGACAGAGCCGTGAAAAGCGAAGAAGAT	900
CCAAAACCGTTCTTCCACGAGTTCATAGAAGAGGTGGCACTGGATGTATA	
TTCTCTTCAGAGAGATGAAGAA	972

FIG. 62

MPVTFLTGTAE TQKEELIKLLKDG NVEYIRIHPEDPDKIDFIRSLLR TK	
TIFS NKTIIDIVNFDEWKAQE QKRLVELLKNVPEDVHIFIRSQKTGGKGV	100
ALELPKPWETDKWLEWIEKRFR ENGLLIDKDALQLFFSKVGTNDLI IERE	
IEKLKAYSEDRKITVEDVEEVFTYQTPGYDDFCFAVSEGKRKLAHSLLS	200
QLWKT TESVVIATVLANHFLDLFKILVLVTKKRYYTWPDVSRVSKELGIP	
VPRVARFLGFSFKTWKFKVMNHLLYYDVKKVRKILRDLYDLDR AVKSEED	300
PKPFFHEFIEEVALDVYSLQRDEE	

FIG. 63

ATGAACGATTTGATCAGAAAGTACGCTAAAGATCAACTGGAAACTTTGAA	
AAGGATCATAGAAAAGTCTGAAGGAATATCCATCCTCATAAATGGAGAAG	100
ATCTCTCGTATCCGAGAGAAGTATCCCTTGAACCTCCCGAGTACGTGGAG	
AAATTTCCCCCGAAGGCCTCGGATGTTCTGGAGATAGATCCCGAGGGGGA	200
GAACATAGGCATAGACGACATCAGAACGATAAAGGACTTCCTGAACTACA	
GCCCCGAGCTCTACACGAGAAAAGTACGTGATAGTCCACGACTGTGAAAGA	300
ATGACCCAGCAGGCGGCGAACGCGTTTCTGAAGGCCCTTGAAGAACCACC	
AGAATACGCTGTGATCGTTCTGAACACTCGCCGCTGGCATTATCTACTGC	400
CGACGATAAAGAGCCGAGTGTTTCTGAGTGGTTGTGAACGTTCCAAAGGAG	
TTCAGAGATCTCGTGAAAGAGAAAATAGGAGATCTCTGGGAGGAACTTCC	500
ACTTCTTGAGAGAGACTTCAAACGGCTCTCGAAGCCTACAAACTTGGTG	
CGGAAAAACTTTCTGGATTGATGGAAGTCTCAAAGTTTTGGAGACGGAA	600
AAACTCTTGAAAAAGGTCCTTTCAAAGGCCTCGAAGGTTATCTCGCATG	
TAGGGAGCTCCTGGAGAGATTTTCAAAGGTGGAATCGAAGGAATTCTTTG	700
CGCTTTTTTGATCAGGTGACTAACACGATAACAGGAAAAGACGCGTTTCTT	
TTGATCCAGAGACTGACAAGAATCATTCTCCACGAAAACACATGGGAAAG	800
CGTTGAAGATCAAAAAGCGTGTCTTTCCTCGATTCAATTCTCAGGGTGA	
AGATAGCGAATCTGAACAACAACTCACTCTGATGAACATCCTCGCGATA	900
CACAGAGAGAGAAAGAGAGGTGTCAACGCTTGGAGC	

FIG. 64

MNDLIRKYAKDQLETLKRIIEKSEGISILINGEDLSYPREVSLELPEYVE	
KFPPKASDVLEIDPEGENIGIDDIRTIKDFLNYSPELYTRKYVIVHDCER	100
MTQQAANAFLKALEEPPEYAVIVLNTRRWHYLLPTIKSRVFRVVVNPKE	
FRDLVKEKIGDLWEELPLLERDFKTALEYKLGAEKLSGLMESLKVLETE	200
KLLKKVLSKGLEGYLACRELLERFSKVESKEFFALFDQVTNTITGKDAFL	
LIQRLTRIILHENTWESVEDKSVSFLDSILRVKIANLNNKLTLMNILAIH	300
RERKRGVNAWS	

FIG. 65

ATGTCCTTTCTTCAACAAGATCATACTCATAGGAAGACTCGTGAGAGATCC	
CGAAGAGAGATACACGCTCAGCGGAACCTCCAGTCACCACCTTCACCATAG	100
CGGTGGACAGGGTTCCAGAAAGAACGCGCCGGACGACGCTCAAACGACT	
GATTTCTTCAGGATCGTCACCTTTGGAAGACTGGCAGAGTTCGCTAGAAC	200
CTATCTCACCAAAGGAAGGCTCGTTCTCGTCGAAGGTGAAATGAGAATGA	
GAAGATGGGAAACACCCACTGGAGAAAAGAGGGTATCTCCGGAGGTTGTC	300
GCAAACGTTGTTAGATTGATGGACAGAAAACCTGCTGAAACAGTTAGCGA	
GACTGAAGAGGAGCTGGAAATACCGGAAGAAGACTTTTCCAGCGATACCT	400
TCAGTGAAGATGAACCACCATT	

FIG. 66

MSFFNKIILIGRLVRDPEERYTLSGTPVTTFTIAVDRVPRKNAPDDAQT	
DFFRIVTFGRLAEFARTYLTGRLVLVEGEMRMRRWETPTGEKRVSPVV	100
ANVVRFMDRKPAETVSETEEELEIPEEDFSSDTFSEDEPPF	

FIG. 67

ATGCGTGTTCCCCCGCACAACTTAGAGGCCGAAGTTGCTGTGCTCGGAAG	
CATATTGATAGATCCGTCGGTAATAAACGACGTTCTTGAAATTTTGAGCC	100
ACGAAGATTTCTATCTGAAAAAACACCAACACATCTTCAGAGCGATGGAA	
GAGCTTTACGACGAAGGAAAAACCGGTGGACGTGGTTTCCGTCTGTGACAA	200
GCTTCAAAGCATGGGAAAACTCGAGGAAGTAGGTGGAGATCTGGAAGTGG	
CCCAGCTCGCTGAGGCTGTGCCAGTTCTGCACACGCACTTCACTACGCG	300
GAGATCGTCAAGGAAAAATCCATTCTGAGGAACTCATTGAGATCTCCAG	
AAAAATCTCAGAAAGTGCCTACATGGAAGAAGATGTGGAGATCCTGCTCG	400
ACAACGCAGAAAAGATGATCTTCGAGATCTCAGAGATGAAAACGACAAAA	
TCCTACGATCATCTGAGAGGCATCATGCACCGGGTGTGTTGAAAACCTGGA	500
GAACTTCAGGGAAAGAGCCAACCTTATAGAACCCGGTGTGCTCATAACGG	
GACTACCAACGGGATTCAAAGTCTGGACAAACAGACCACAGGGTTCCAC	600
AGCTCCGATCTGGTGATAATAGCAGCGAGACCCTCCATGGGAAAAACCTC	
CTTCGCACTCTCAATAGCGAGGAACATGGCTGTCAATTCGAAATCCCCG	700
TCGGAATATTCACTCTCGAGATGTCCAAGGAACAGCTCGCTCAAAGACTA	800
CTCAGCATGGAGTCCGGTGTGGATCTTTACAGCATCAGAACAGGATACCT	
GGATCAGGAGAAGTGGGAAAGACTCACAATAGCGGCTTCTAAACTCTACA	900
AAGCACCCTAGTTGTGGACGATGAGTCACTCCTCGATCCGCGATCGTTG	
AGGGCAAAGCGAGAAGGATGAAAAAGAATACGATGTAAAAGCCATTTT	1000
TGTCGACTATCTCCAGCTCATGCACCTGAAAGGAAGAAAAGAAAGCAGAC	
AGCAGGAGATATCCGAGATCTCGAGATCTCTGAAGCTCCTTGCGAGGGAA	1100
CTCGACATAGTGGTGATAGCGCTTTCACAGCTTTCGAGGGCCGTAGAACA	
GAGAGAAGACAAAAGACCGAGGCTGAGTGACCTCAGGGAATCCGGTGCGA	1200
TAGAACAGGACGCAGACACAGTCATCTTCATCTACAGGAGGAATATTAC	
AGGAGCAAAAAATCCAAAGAGGAAAGCAAGCTTCACGAACCTCACGAAGC	1300
TGAAATCATAATAGGTAAACAGAGAAACGGTCCC GTTGAACGATCACTC	
TGATCTTCGACCCAGAACGGTTACGTTCCATGAAGTCGATGTGGTGCAT	1353
TCA	

FIG. 68

MRVPPHNLEAEVAVLGSILIDPSVINDVLEILSHEDFYLLKKHQHIFRAME	
ELYDEGKPDVSVCDKLQSMGKLEEVGGDLEVAQLAEAVPSSAHALHYA	100
EIVKEKSILRKLIIEISRKISESAYMEEDVEILLDNAEKMIFEISEMKTTK	
SYDHLRGIMHRVFENLENFRERANLIEPGVLITGLPTGFKSLDKQTTGFH	200
SSDLVIIAARPSMGKTSFALSIARNMAVNFEIPVGIFSLEMSKEQLAQL	
LSMESGVDLYSIRTGYLDQEKWERLTIAASKLYKAPIVVDDDESLLDPRSL	300
RAKARRMKKEYDVKAIFVDYLQLMHLKGRKESRQQEISEISRSCLKLLARE	
LDIVVIALSQLSRAVEQREDKRPRLSDLRESGAIEQDADTVIFIYREEYY	400
RSKKSKEESKLHEPHEAEIIIGKQRNGPVGTTITLIFDPRTVTFHEVDVVH	
S	451

FIG. 69

GTGATTCTCGAGAGGTCATCGAGGAAATAAAAGAAAAGGTTGACATCGT	
AGAGGTCATTTCCGAGTACGTGAATCTTACCCGGGTAGGTTCTCTCTACA	100
GGGCTCTCTGTCCCTTTTCATTTCAGAAACCAATCCTTCTTTCTACGTTTCAT	
CCGGGTTTGAAGATATACCATTGTTTTCGGCTGCGGTGCGAGTGGAGACGT	200
CATCAAATTTCTTCAAGAAATGGAAGGGATCAGTTTCCAGGAAGCGCTGG	
AAAGACTTGCCAAAAGAGCTGGGATTGATCTTTCTCTCTACAGAACAGAA	300
GGGACTTCTGAATACGGAATAACATTCGTTTGTACGAAGAAACGTGGAA	
AAGGTACGTCAAAGAGCTGGAGAAATCGAAAGAGGCAAAAGACTATTTAA	400
AAAGCAGAGGCTTCTCTGAAGAAGATATAGCAAAGTTCGGCTTTGGGTAC	
GTCCCAAGAGATCCAGCATCTCTATAGAAGTTGCAGAAGGCATGAACAT	500
AACACTGGAAGAACTTGTGAGATACGGTATCGCGCTGAAAAAGGGTGATC	
GATTCGTTGATAGATTGGAAGGAAGAATCGTTGTTCCAATAAAGAACGAC	600
AGTGGTCATATTGTGGCTTTTGGTGGGCGTGCTCTCGGCAACGAAGAACC	
GAAGTATTTGAACTCTCCAGAGACCAGGTATTTTTTCGAAGAAGAAGACCC	700
TTTTTCTCTTCGATGAGGCGAAAAAGTGGCAAAAGAGGTTGGTTTTTTC	
GTCATCACCGAAGGCTACTTCGACGCGCTCGCATTTCAGAAAGGATGGAAT	800
ACCAACGGCGGTGCGCTGTTCTTGGGGCGAGTCTTTCAAGAGAGGCGATTC	
TAAACTTTTCGGCGTATTTCGAAAAACGTCACTACTGTGTTTCGATAATGAC	900
AAAGCAGGCTTCAGAGCCACTCTCAAATCCCTCGAGGATCTCCTAGACTA	
CGAATTCAACGTGCTTGTGGCAACCCCTCTCCTTACAAAGACCCAGATG	1000
AACTCTTTTCAGAAAGAAGGAGAAGGTTTCATTGAAAAAGATGCTGAAAAAC	
TCGCGTTTCGTTTGAATATTTTCTGGTGACGGCTGGTGAGGTCTTCTTTGA	1100
CAGGAACAGCCCCGCGGGTGTGAGATCCTACCTTTCTTTCCTCAAAGGTT	
GGGTCCAAAAGATGAGAAGGAAAGGATATTTGAAACACATAGAAAATCTC	1200
GTGAATGAGGTTTCATCTTCTCTCCAGATACCAGAAAACCAGATTTTGAA	
CTTTTTTGAAAGCGACAGGTCTAACACTATGCCTGTTTCATGAGACCAAGT	1300
CGTCAAAGGTTTACGATGAGGGGAGAGGACTGGCTTATTTGTTTTTGAAC	
TACGAGGATTTGAGGGAAAAGATTCTGGAACCTGGACTTAGAGGTACTGGA	1400
AGATAAAAACGCGAGGGAGTTTTTCAAGAGAGTCTCACTGGGAGAAGATT	
TGAACAAAGTCATAGAAAACCTTCCCAAAGAGCTGAAAGACTGGATTTTTT	1500
GAGACAATAGAAAGCATTCTCCTCCAAAGGATCCCGAGAAATTCCTCGG	
TGACCTCTCCGAAAAGTTGAAAATCCGACGGATAGAGAGACGTATCGCAG	1600
AAATAGATGATATGATAAAGAAAGCTTCAAACGATGAAGAAAGGCGTCTT	
CTTCTCTCTATGAAAGTGATCTCCTCAGAAAAATAAAGAGGAGG	1695

FIG. 70

MIPREVIEEIKEKVDIVEVISEYVNLTRVGSSYRALCPFHSETNPSFYVH	
PGLKIYHCFGCGASGDVIKFLQEMEGISFQEALERLAKRAGIDLSLYRTE	100
GTSEYGKYIRLYEETWKRYVKELEKSKEAKDYLSRGFSEEDIAKFGFGY	
VPKRSSISIEVAEGMNITLEELVRYGIALKKGDRFVDRFEGRIVVPIKND	200
SGHIVAFGGRALGNEEPKYLNSPETRYFSKKKTLFLFDEAKKVAKEVGFF	
VITEGYFDALAFRKDGIPTAVAVLGASLSREAILKLSAYSKNVILCFDND	300
KAGFRATLKSLEDLLDYEFNVLVATPSPYKDPDELFOKEGEGSLKKMLKN	
SRSFEYFLVTAGEVFFDRNSPAGVRSYLSFLKGWVQKMRRKGYLKHIENL	400
VNEVSSSLQIPENQILNFFESDRSNTMPVHETKSSKVYDEGRGLAYLFLN	
YEDLREKILELDLEVLEDKNAREFFKRVSLGEDLNKVIENFPKELKDWIF	500
ETIESIPPPKDPEKFLGDLSEKLKIRRIERRIAEIDDMIKKASNDEERRL	
LLSMKVDLLRKIKRR	565

FIG. 71

ATGGCTCTACACCCGGCTCACCCTGGGGCAATAATCGGGCACGAGGCCGT	
TCTCGCCCTCCTTCCCCGCCTCACCGCCAGACCCTGCTCTTCTCCGGCC	100
CCGAGGGGGTGGGGCGGCGCACCGTGGCCCGCTGGTACGCCTGGGGGCTC	
AACCGCGGCTTCCCCCGCCCTCCCTGGGGGAGCACCCGGACGTCCTCGA	200
GGTGGGGCCCAAGGCCCGGGACCTCCGGGGCCGGGCCGAGGTGCGGCTGG	
AGGAGGTGGCGCCCTCTTGGAGTGGTGCTCCAGCCACCCCCGGGAGCGG	300
GTGAAGGTGGCCATCCTGGACTCGGCCACCTCCTCACCAGGCCGCCGC	
CAACGCCCTCCTCAAGCTCCTGGAGGAGCCCCCTTCTACGCCCGCATCG	400
TCCTCATCGCCCCAAGCCGCGCCACCCTCCTCCCCACCCTGGCCTCCCGG	
GCCACGGAGGTGGCATTGCCCCCGTGCCCGAGGAGGCCCTGCGCGCCCT	500
CACCCAGGACCCGGAGCTCCTCCGCTACGCCCGCGGGGCCCGGGCCGCC	
TCCTTAGGGCCCTCCAGGACCCGGAGGGGTACCGGGCCCGCATGGCCAGG	600
GCGCAAAGGGTCTTGAAAGCCCCGCCCTGGAGCGCCTCGCTTTGCTTCG	
GGAGCTTTTGGCCGAGGAGGAGGGGGTCCACGCCCTCCACGCCGTCCTAA	700
AGCGCCCGGAGCACCTCCTTGCCCTGGAGCGGGCGCGGGAGGCCCTGGAG	
GGGTACGTGAGCCCCGAGCTGGTCTCGCCCGGCTGGCCTTAGACTTAGA	800
GACA	

FIG. 72

MALHPAHPGAIIGHEAVLALLPRLTAQTLLFSGPEGVGRRTVARWYAWGL	
NRGFPPPSLGEHPDVLEVGPKARDLRGRAEVRLEEVAPLLEWCSSHPRER	100
VKVAILDSAHLLTEAAANALLKLLLEPPSYARIVLIAPSRA TLPTLASR	
ATEVAFAPVPEEALRALTQDPELLRYAAGAPGRLLRALQDPEGYRARMAR	200
AQRVLKAPPLERLALLRELLAE EEGVHALHAVLKRPEHLLALERAREALE	
GYVSPELVLARLALDLET	268

FIG. 73

ATGCTGGACCTGAGGGAGGTGGGGGAGGCGGAGTGGAAGGCCCTAAAGCC	
CCTTTTGGAAAGCGTGCCCGAGGGCGTCCCCGTCTCCTCCTGGACCCTA	100
AGCCAAGCCCCTCCCGGGCGGCCTTCTACCGGAACCGGGAAGGCGGGAC	
TTCCCCACCCCCAAGGGGAAGGACCTGGTGCGGCACCTGGAAAACCGGGC	200
CAAGCGCCTGGGGCTCAGGCTCCCGGGCGGGGTGGCCAGTACCTGGCCT	
CCCTGGAGGGGGACCTCGAGGCCCTGGAGCGGGAGCTGGAGAAGCTTGCC	300
CTCCTCTCCCCACCCCTCACCCCTGGAGAAGGTGGAGAAGGTGGTGGCCCT	
GAGGCCCCCCTCACGGGCTTTGACCTGGTGCGCTCCGTCTGGAGAAGG	400
ACCCCAAGGAGGCCCTCCTGCGCCTAGGCGGCCTCAAGGAGGAGGGGGAG	
GAGCCCCTCAGGCTCCTCGGGGCCCTCTCCTGGCAGTTGCCCCCTCTCGC	500
CCGGGCCTTCTTCTCCTCCTCCGGGAAAACCCAGGCCCAAGGAGGAGGACC	
TCGCCCCGCTCGAGGCCACCCCTACGCCGCCCGCCGCGCCCTGGAGGCG	600
GCGAAGCGCCTCACGGAAGAGGCCCTCAAGGAGGCCCTGGACGCCCTCAT	
GGAGGCGGAAAAGAGGGCCAAGGGGGGGAAAGACCCGTGGCTCGCCCTGG	700
AGGCGGCGGTCTCTCCGCCTCGCCCGTTGA	

FIG. 74

MVIAFTGDPFLAREALLEEARLRGLSRFTEPTPEALAQALAPGLFGGGGA	
MLDLREVGEAEWKALKPLLESVPEGVPVLLLDPKPSPSRAAFYRNRERRD	100
FPTPKGKDLVRHLENRAKRLGLRLPGGVAQYLASLEGDLEALERELEKLA	
LLSPPLTLEKVEKVVALRPPLTGFDLVRSVLEKDPKEALLRLGGLKEEGE	200
EPLRLLGALSWQFALLARAFFLLRENPRPKEEDLARLEAHPYAARRALEA	
AKRLTEEALKEALDALMEAEKRAKGKDPWLALAAVLRLAR	292

FIG. 75

ATGGCTCGAGGCCTGAACCGCGTTTTTCCTCATCGGCGCCCTCGCCACCCG	
GCCGGACATGCGCTACACCCCGCGGGGCTCGCCATTTTGGACCTGACCC	100
TCGCCGGTCAGGACCTGCTTCTTTCCGATAACGGGGGGGAACCGGAGGTG	
TCCTGGTACCACCGGGTGAGGCTCTTAGGCCGCCAGGCGGAGATGTGGGG	200
CGACCTCTTGGACCAAGGGCAGCTCGTCTTCGTGGAGGGCCGCCTGGAGT	
ACCGCCAGTGGGAAAGGGAGGGGGAGAAGCGGAGCGAGCTCCAGATCCGG	300
GCCGACTTCCGGACCCCCTGGACGACCGGGGGAAGAAGCGGGCGGAGGAC	
AGCCGGGGCCAGCCCAGGCTCCGCGCCGCCCTGAACCAGGTCTTCCTCAT	400
GGGCAACCTGACCCGGGACCCGGAACCTCCGCTACACCCCCCAGGGCACCG	
CGGTGGCCCCGGCTGGGCCTGGCGGTGAACGAGCGCCGCCAGGGGGCGGAG	500
GAGCGCACCCACTTCGTGGAGGTTCAAGCCTGGCGCGACCTGGCGGAGTG	
GGCCGCCGAGCTGAGGAAGGGCGACGGCCTTTTCGTGATCGGCAGGTTGG	600
TGAACGACTCCTGGACCAGCTCCAGCGGCGAGCGGCGCTTCCAGACCCGT	
GTGGAGGCCCTCAGGCTGGAGCGCCCCACCCGTGGACCTGCCCAGGCCTG	700
CCCAGGCCGGCGGAACAGGTCCCGCGAAGTCCAGACGGGTGGGGTGGACA	
TTGACGAAGGCTTGGAAGACTTTCGCGCGGAGGAGGATTTGCCGTTTGA	800
GCACGAA	

FIG. 76

MARGLNRVFLIGALATRPDMRYTPAGLAILDLTLAGQDLLLSDNNGEPEV	
SWYHRVRLGRQAEMWGDLLDQGQLVFVEGRLEYRQWEREGEKRSELQIR	100
ADFLDPLDDRGKKRAEDSRGQPRRLRAALNQVFLMGNLTRDPELRYTPQGT	
AVARLGLAVNERRQGAERTHFVEVQAWRDLAEWAAELRKGDGLFVIGRL	200
VNDSWTSSSGERRFQTRVEALRLERPTRGPAQACPGRNRNSREVQTGGVD	
IDEGLEDFPPEEDLPF	266

FIG. 77

AATTCGGACATTTCAATTGAATCGTTTATTCCGCTTGAAAAAGAAGGCAA	
GTTGCTCGTTGATGTGAAAAGACCGGGGAGCATCGTACTGCAGGCGCGCT	100
TTTTCTCTGAAATCGTGAAAAAACTGCCGCAACAAACGGTGGAATCGAA	
ACGGAAGACAACCTTTTTGACGATCATCCGCTCGGGGCACTCAGAATTCCG	200
CCTCAATGGGCTAAACGCCGACGAATATCCGCGCCTGCCGCAAATTGAAG	
AAGAAAACGTGTTTCAAATCCCGGCTGATTTATTGAAAACCGTGATTTCGG	300
CAAACGGTGTTTCGCCGTTTCTACATCGGAAACGCGCCCAATCTTGACAGG	
TGTCAACTGGAAAGTTGAACATGGCGAGCTTGTCTGCACAGCGACCGACA	400
GTTCATCGCTTAGCCATGCGCAAAGTGAAAATTGAGTCGGAAAATGAAGTA	
TCATACAACGTCGTCATCCCTGGAAAAAGTCTTAATGAGCTCAGCAAAAT	500
TTTGGATGACGGCAACCACCCGGTGGACATCGTCATGACAGCCAATCAAG	
TGCTATTTAAGGCCGAGCACCTTCTCTTCTTTCCCGGCTGCTTGACGGC	600
AACTATCCGGAGACGGCCCGCTTGATTCCAACAGAAAGCAAAACGACCAT	
GATCGTCAATGCAAAAGAGTTTCTGCAGGCAATCGACCGAGCGTCCTTGC	700
TTGCTCGAGAAGGAAGGAACAACGTTGTGAAACTGACGACGCTTCCTGGA	
GGAATGCTCGAAATTTCTTCGATTTCTCCGAGATCGGGAAAGTGACGGAG	800
CAGCTGCAAACGGAGTCTCTTGAAGGGGAAGAGTTGAACATTTCTGTTAG	
CGCGAAATATATGATGGACGCGTTGCGGGCGCTTGATGGAACAGACATTT	900
CAAATCAGCTTCACTGGGGCCATGCGGCCGTTCTGTGTCGCCCCGCTTCA	
ACCGATTGATGCTTCAGCTCATTTTGCCGGTGAGAACATAT	992

FIG. 78

NSDISIIESFIPLEKEGKLLVDVKRPGSIVLQARFFSEIVKKLPQQTVEI	
ETEDNFLTIIIRSGHSEFRLNGLNADEYPRLPQIEEENVFQIPADLLKTVI	100
RQTVFAVSTSETRPILTGVDNWKVEHGELVCTATDSHRLAMRKVKII ESEN	
EVSYNVVI PGKSLNELSKI ILDDGNHPVDIVMTANQVLFKAEHLLFFSRL	200
LDGNYPETARLIPTESKTTMIVNAKEFLQAI DRASLLAREGRNNVVKLTT	
LPGGMLEISSISPEIGKVTEQLQTESLEGEELNISFS AKYMMDALRALDG	300
TDIQISFTGAMRPFLRLPLHTDSMLQLILPVRTY	

FIG. 79

ATGATTAACCGCGTCATTTTGGTCGGCAGGTTAACGAGAGATCCGGAGTT	
GCGTTACACTCCAAGCGGAGTGGCTGTTGCCACGTTTACGCTCGCGGTCA	100
ACCGTCCGTTTACAAATCAGCAGGGCGAGCGGGAACGGATTTTATTCAA	
TGTGTCGTTTGGCGCCGCCAGGCGGAAAACGTCGCCAACTTTTGA	200
GGGAGCTTGGCTGGTGTTCGATGGCCGACTGCAAACCCGCAGCTATGAAA	
ATCAAGAAGGTCGGCGTGTGTACGTGACGGAAGTGGTGGCTGATAGCGTC	300
CAATTTCTTGAGCCGAAAGGAACGAGCGAGCAGCGAGGGGGCGACAGCAGG	
CGGCTACTATGGGGATCCATTCCCATTCGGGCAAGATCAGAACCACCAAT	400
ATCCGAACGAAAAAGGGTTTGGCCGCATCGATGACGATCCTTTCGCCAAT	
GACGGCCAGCCGATCGATATTTCTGATGATGATTGCCGTTT	492

FIG. 80

MINRVILVGRLTRDPELRYTPSGVAVATFTLAVNRPFTNQSYENQEGRRV	
YVTEVVADSVQFLEPKGTSEQRGATAGGYQGERETDFIQCVVWRRQAEN	100
VANFLKKGSLAGVDGRLQTRGDPFPFGQDQNHQYPNEKGFGRIDDDPFAN	
DGQPIDISDDDLPF	164

FIG. 81

ATGCTGGAACGCGTATGGGGAAACATTGAAAAACGGCGTTTTTCTCCCCT	
TTATTTATTATACGGCAATGAGCCGTTTTTATTAACGGAAACGTATGAGC	100
GATTGGTGAACGCAGCGCTTGGCCCCGAGGAGCGGGAGTGGAAC TTGGCT	
GTGTACGACTGCGAGGAAACGCCGATCGAGGCGGCGCTTGAGGAGGCCGA	200
GACGGTGCCGTTTTTTCGGCGAGCGGCGTGTCAATTCTCATCAAGCATCCAT	
ATTTTTTTTACGTCTGAAAAAGAGAAGGAGATCGAACATGATTTGGCGAAG	300
CTGGAGGCGTACTTGAAGGCGCCGTCGCCGTTTTTCGATCGTCGTCTTTTT	
CGCGCCGTACGAGAAGCTTGATGAGCGAAAAAAATTACGAAGCTCGCCA	400
AAGAGCAAAGCGAAGTCGTCATCGCCGCCCGCTCGCCGAAGCGGAGCTG	
CGTGCCTGGGTGCGGCGCCGCATCGAGAGCCAAGGGGCGCAAGCAAGCGA	500
CGAGGCGATTGATGTCCTGTTGCGGCGGGCCGGGACGCAGCTTTCGCGCT	
TGGCGAATGAAATCGATAAATTGGCCCTGTTTGCCGGATCGGGCGGAACC	600
ATCGAGGCGGCGGCGGTTGAGCGGCTTGTCGCCCGCACGCCGGAAGAAAA	
CGTATTTGTGCTTGTCGAGCAAGTGGCGAAGCGCGACATTCCAGCAGCGT	700
TGCAGACGTTTTATGATCTGCTTGAAAACAATGAAGAGCCGATCAAAATT	
TTGGCGTTGCTCGCCGCCCATTTCCGCTTGCTTTCGCAAGTGAAATGGCT	800
TGCCTCCTTAGGCTACGGACAGGCGCAAATTGCTGCGGCGCTCAAGGTGC	
ACCCGTTCCGCGTCAAGCTCGCTCTTGCTCAAGCGGCCCGCTTCGCTGAC	900
GGAGAGCTTGCTGAGGCGATCAACGAGCTCGCTGACGCCGATTACGAAGT	
GAAAAGCGGGGCGGTGATCGCCGTTGGCCGTTGAGCTGCTTCTGATGC	1000
GCTGGGGCGCCCGCCCGGCGCAAGCGGGGCGCCACGGCCGGCGG	

FIG. 82

MLERVWGNIEKRRFSPLYLLYGNEPFLLTETYERLVNAALGPEEREWNLA	
VYDCEETPIEAALEEAETVPFFGERRVILIKHPYFFTSEKEKEIEHDLAK	100
LEAYLKAPSPFSIVVFFAPYEKLDERKKITKLAKSEQSEVVIAAPLAEDEL	
RAWVRRRIESQGAQASDEAIDVLLRRAGTQLSALANEIDKLALFAGSGGT	200
IEAAVERLVARTPEENVFVLVEQVAKRDI PAALQTFYDLLENNEEPIKI	
LALLAAHFRLLSQVKWLASLGYGQAQIAAALKVHPFRVKLALAQARFAD	300
GELAEAINELADADYEVKSGAVDRRLAVELLMLRWGARPAQAGRHGR	

FIG. 83

ATGCGATGGGAACAGCTAGCGAAACGCCAGCCGGTGGTGGCGAAAATGCT	
GCAAAGCGGCTTGAAAAAGGGCGGATTTCTCATGCGTACTTGTTTGAGG	100
GGCAGCGGGGACGGGCAAAAAGCGGCCAGTTTGTTGTTGGCGAAACGT	
TTGTTTTGTCTGTCCCCAATCGGAGTTTCCCCGTGTCTAGAGTGCCGCAA	200
CTGCCGGCGCATCGACTCCGGCAACCACCCTGACGTCCGGGTGATCGGCC	
CAGATGGAGGATCAATCAAAAAGGAACAAATCGAATGGCTGCAGCAAGAG	300
TTCTCGAAAACAGCGGTTCGAGTCGGATAAAAAAATGTACATCGTTGAGCA	
CGCCGATCAAATGACGACAAGCGCTGCCAACAGCCTTCTGAAATTTTTTG	400
AAGAGCCGCATCCGGGGACGGTGGCGGTATTGCTGACTGAGCAATACCAC	
CGCTGCTAGGGACGATCGTTTCCCGCTGTCAAGTGCTTTCGTTCCGGCC	500
GTTGCCGCCGGCAGAGCTCGCCCAGGGACTTGTCGAGGAGCACGTGCCGT	
TGCCGTTGGCGCTGTTGGCTGCCCATTTGACAAACAGCTTCGAGGAAGCA	600
CTGGCGCTTGCCAAAGATAGTTGGTTTGCCGAGGCGCGAACATTAGTGCT	
ACAAATGGTATGAGATGCTGGGCAAGCCGGAGCTGCAGCTTTTGTTTTTCA	700
TCCACGACCGCTTGTTTCCGCATTTTTTGAAAGCCATCAGCTTGACCTT	
GGACTTG	757

FIG. 84

MRWEQLAKRQPVVAKMLQSGLEKGRISHAYLFEGQRTGKKAASLLAKR	
LFCLSPIGVSPCLECRNCRRIDSGNHPDVRVIGPDGGSIKKEQIEWLQQE	100
FSKTAVESDKMYIVEHADQMTTSAANSLLKFLEEPHPGTVAVLLTEQYH	
RLLGTVSRQVLSFRPLPPAELAQGLVEEHVPLPLALLAAHLTNSFEEA	200
LALAKDSWFAEARTLVLQWYEMLGKPELQLLFFIHDRLPHPFLESHQLDL	
GL	252

FIG. 85

GTGGCATAACCAAGCGTTATATCGCGTGTTTTCGGCCGCAGCGCTTTGCGGA	
CATGGTTCGGCCAAGAACACGTGACCAAGACGTTGCAAAGCGCCCTGCTTC	100
AACATAAAATATCGCACGCTTACTTATTTTCCGGCCCGCGCGGTACAGGA	
AAAACGAGCGCAGCGAAAATTTTCGCCAAGGCGGTCAACTGTGAACAGGC	200
GCCAGCGGCGGAGCCATGCAATGAGTGTCAGCTTGCCTCGGCATTACGA	
ATGGAACGGTTCCCGATGTGCTGGAAATTGACGCTGCTTCCAACAACCGC	300
GTCGATGAAATTCGTGATATCCGTGAGAAGGTGAAATTTGCGCCAACGTC	
GGCCCGCTACAAAGTGTATATCATCGACGAGGTGCATATGCTGTGCGATCG	400
GTGCGTTTTAACGCGCTGTTGAAAACGTTGGAGGAGCCGCCGAAACACGTC	
ATTTTCATTTTGGCCACGACCGAGCCGCACAAAATTCGGGCGACGATCAT	500
TTCCCGCTGCCAACGGTTCGATTTTCGCCGCATCCCGCTTCAGGCGATCG	
TTTCACGGCTAAAGTACGTGCAAGCGCCCAAGGTGTCGAGGCGTCAGAT	600
GAGGCATTGTCCGCCATCGCCCGTGCTGCAGACGGGGGGATGCGCGATGC	
GCTCAGCTTGCTTGATCAAGCCATTTTCGTTACGCGACGGGAACTTCGGC	700
TCGACGACGTGCTGGCGATGACCGGGGCTGCATCATTTGCCGCCTTATCG	
AGCTTCATCGAAGCCATCCACCGCAAAGATACAGCGGCGGTTCTTCAGCA	800
CTTGGAACGATGATGGCGCAAGGGAAAGATCCGCATCGTTTGGTTGAAG	
ACTTGATTTTGTACTATCGCGATTTATTGCTGTACAAAACCGCTCCCTAT	900
GTGGAGGGAGCGATTCAAATTGCTGTCGTTGACGAAGCGTTCACTTCACT	
GTCGGAATGATTCCGGTTTCCAATTTATACGAGGCCATCGAGTTGCTGA	1000
ACAAAAGCCAGCAAGAGATGAAGTGGACAAACCACCCGCGCCTTCTGTTG	
GAAGTGGCGCTTGTGAAACTTTGCCATCCATCAGCCGCCGCCCGTCGCT	1100
GTCGGCTTCCGAGTTGGAACCGTTGATAAAGCGGATTGAAACGCTGGAGG	
CGGAATTGCGGCGCCTGAAGGAACAACCGCCTGCCCTCCGTGACCGCC	1200
GCGCCGGTGAAAAAACTGTCCAAACCGATGAAAACGGGGGGATATAAAGC	
CCCGGTTGGCCGCATTTACGAGCTGTTGAAACAGGCGACGCATGAAGATT	1300
TAGCTTTGGTGAAAGGATGCTGGGCGGATGTGCTCGACACGTTGAAACGG	
CAGCATAAAGTGTCGCACGCTGCCTTGCTGCAAGAGAGCGAGCCGGTTGC	1400
AGCGAGCGCCTCAGCGTTTGTATTAAAATTCAAATACGAAATCCACTGCA	
AAATGGCGACCGATCCCACAAGTTCGGTCAAAGAAAACGTCGAAGCGATT	1500
TTGTTTGAGCTGACAAACCGCCGCTTTGAAATGGTAGCCATTCCGGAGGG	
AGAATGGGGAAAAATAAGAGAAGAGTTCATCCGCAATAAGGACGCCATGG	1600
TGGAAAAAAGCGAAGAAGATCCGTTAATCGCCGAAGCGAAGCGGCTGTTT	
GGCGAAGAGCTGATCGAAATTAAAGAA	1677

FIG. 86

VAYQALYRVFRPQRFADMVGQEHVTKTLQSALLQHKISHAYLFSGPRGTG	
KTSAAKIFAKAVNCEQAPAAEPCNECPACLGITNGTVPDVLEIDAASNNR	100
VDEIRDIREKVKFAPTSARYKVYIIDEVHMLSIGAFNALLKTLEPPKHV	
IFILATTEPHKIPATIIISRCQRFDFRRIPLQAIVSRLKYVASAQGVEASD	200
EALSAIARAADGGMRDALSLLDQAISFSDGKLRLDDVLAMTGAASFAALS	
SFIEAIHRKDTAAVLQHLETMMAQGKDPHRLVEDLILYYRDLLLYKTAPY	300
VEGAIQIAVVDEAFTSLSEMIPVSNLYEAIELLNKSQQEMKWTNHPRLLL	
EVALVKLCHPSAAAPSLSASELEPLIKRIETLEAELRRLKEQPPAPPSTA	400
APVKKLSKPMKTGGYKAPVGRIYELLKQATHEDLALVKGCVADVLDTLKR	
QHKVSHAALLQESEPVAASASAFVLKFYIEIHCKMATDPTSSVKENVEAI	500
LFELTNRRFEMVAIPEGEGWKIREEFIRNKDAMVEKSEEDPLIAEAKRLF	
GEELIEIKE	559

FIG. 87

ATGGTGACAAAAGAGCAAAAAGAGCGGTTTCTCATCCTGCTTGAGCAGCT	100
GAAGATGACGTCGGACGAATGGATGCCGCATTTTCGTGAGGCAGCCATTC	
GCAAAGTCGTGATCGATAAAGAGGAGAAAAGCTGGCATTTTTATTTTCAG	200
TTCGACAACGTGCTGCCGGTTCATGTATACAAAACGTTTGCCGATCGGCT	
GCAGACGGCGTTCCGCCATATCGCCGCCGTCCGCCATACGATGGAGGTGC	300
AAGCGCCGCGCGTAACCTGAGGCGGATGTGCAGGCGTATTGGCCGCTTTGC	
CTTGCCGAGCTGCAAGAAGGCATGTGCGCCGCTTGTCGATTGGCTCAGCCG	400
GCAGACGCCTGAGCTGAAAGGAAACAAGCTGCTTGTCGTTGCCCGCCATG	
AAGCGGAAGCGCTGGCGATCAAACGGCGGTTCCGCCAAAAAATCGCTGAT	500
GTGTACGCTTCGTTTGGGTTTCCCCCCTTCAGCTTGACGTCAGCGTCGA	
GCCGTCCAAGCAAGAAATGGAACAGTTTTTTGGCGCAAAAACAGCAAGAGG	600
ACGAAGAGCGAGCGCTTGCTGTACTGACCGATTTAGCGAGGGAAGAAGAA	
AAGGCCGCGTCTGCGCCGCCGTCCGGTCCGCTTGTCATCGGCTATCCGAT	700
CCGCGACGAGGAGCCGGTGCGGCGGCTTGAAACGATCGTCGAAGAAGAGC	
GGCGCGTCGTTGTGCAAGGCTATGTATTTGACGCCGAAGTGAGCGAATTA	800
AAAAGCGCCGCACGCTGTTGACCATGAAAATCACAGATTACACGAACTC	
GATTTTAGTCAAAATGTTCTCGCGCGACAAAGAGGACGCCGAGCTTATGA	900
GCGGCGTCAAAAAGGCATGTGGGTGAAAGTGCGCGGCAGCGTGCAAAAC	
GATACGTTTCGTCCGTGATTTGGTCATCATCGCCAACGATTTGAACGAAAT	1000
CGCCGCAACGAACGGCAAGATACGGCGCCGGAAGGGGAAAAGAGGGTGC	
AGCTCCATTTGCATACCCCGATGAGCCAAATGGACGCGGTACCTCGGTG	1100
ACAAAACTCATTGAGCAAGCGAAAAAATGGGGGCATCCGGCGATCGCCGT	
CACCGACCATGCCGTTGTTCAAGTCGTTTCCGGAGGCCTACAGCGCGGCGA	1200
AAAAACACGGCATGAAGGTCATTTACGGCCTTGAGGCGAACATCGTCGAC	
GATGGCGTGCCGATCGCCTACAATGAGACGCACCGCCGTCTTTCGGAGGA	1300
AACGTACGTCGTCTTTGACGTCGAGACGACGGGCCTGTCGGCTGTGTACA	
ATACGATCATTGAGCTGGCGGCGGTGAAAGTGAAAGACGGCGAGATCATC	1400
GACCGATTGATGTCGTTTGCCAACCCTGGACATCCGTTGTCGGTGACAAC	
GATGGAGCTGACTGGGATCACCGATGAGATGGTGAAAGACGCCCCGAAGC	1500
CGGACGAGGTGCTAGCCCGTTTTTGTGACTGGGCGGCGATGCGACGCTT	
GTTGCCACACAACGCCAGCTTTGACATCGGTTTTTTAAACGCGGGCCTCGC	1600
TCGCATGGGGCGCGGCAAAATCGCGAATCCAGTCATCGATACGCTCGAGC	
TGGCCCGTTTTTTTATACCCGGATTTGAAAAACCATCGGCTCAATACATTG	1700
TGCAAAAAATTTGACATTGAATTGACGCAGCATACCGCGCCATCTACGA	
CGCGGAGGCGACCGGGCATTGCTTATGCGGCTGTTGAAGGAAGCGGAAG	1800
AGCGCGGCATACTGTTTCATGACGAATTAACAGCCGCACGCACAGCGAA	
GCGTCCTATCGGCTTGCGCGCCCGTTCCATGTGACGCTGTTGGCGCAAAA	1900
CGAGACTGGATTGAAAAATTTGTTCAAGCTTGTGTCATTGTGCGACATTC	
AATATTTTCACCGTGTGCCGCGCATCCCGCGCTCCGTGCTCGTCAAGCAC	2000
CGCGACGGCCTGCTTGTCGGCTCGGGCTGCGACAAAGGAGAGCTGTTTGA	
CAACTTGATCCAAAAGGCGCCGGAAGAAGTCGAAGACATCGCCCGTTTTT	2100
ACGATTTTCTTGAAGTGCATCCGCCGGACGTGTACAAGCCGCTCATCGAG	
ATGGATTATGTGAAAGACGAAGAGATGATCAAAAACATCATCCGCAGCAT	2200
CGTCGCCCTTGGTGAGAAGCTTGACATCCCGGTTGTCGCCACTGGCAACG	

FIG. 88A

TCCATTACTTGAACCCAGAAGATAAAATTTACCGGAAAATCTTAATCCAT
 TCGCAAGGCGGGGCGAATCCGCTCAACCGCCATGAACTGCCGGATGTATA 2300
 TTTCCGTACGACGAATGAAATGCTTGACTGCTTCTCGTTTTTAGGGCCGG
 AAAAAGCGAAGGAAATCGTCGTTGACAACACGCAAAAAATCGCTTCGTTA 2400
 ATCGGCGATGTCAAGCCGATCAAAGATGAGCTGTATACGCCGCGCATTGA
 AGGGGCGGACGAGGAAATCAGGGAAATGAGCTACCGGCGGGCGAAGGAAA 2500
 TTTACGGCGACCCGTTGCCGAAACTTGTGTAAGAGCGGCTTGAGAAGGAG
 CTAAAAGCATCATCGGCCATGGCTTTGCCGTCATTTATTTGATCTCGCA 2600
 CAAGCTTGTGAAAAATCGCTCGATGACGGCTACCTTGTGCGGGTCGCGCG
 GATCGGTTCGGCTCGTCGTTTGTGCGGACGATGACGGAAATCACCGAGGTC 2700
 AATCCGCTGCCGCCGATTACGTTTGCCCGAACTGCAAGCATTTCGGAGTT
 CTTTAACGACGGTTCAGTCGGCTCAGGGTTTGATTTGCCGGATAAAAACT 2800
 GCCCGCGATGTGGGACGAAATACAAGAAAGACGGGCACGACATCCCGTTT
 GAGACGTTTCTCGGCTTTAAAGGCGACAAAGTGCCGGATATCGACTTGAA 2900
 CTTTTCCGGCGAATACCAGCCGCGCGCCCACTATAACGAAAGTGCTGT
 TTGGCGAAGACAACGTCTACCGCGCCGGGACGATTGGCACGGTCGCTGAC 3000
 AAAACGGCGTACGGATTTGTCAAAGCGTATGCGAGCGACCATAACTTAGA
 GCTGCGCGGCGCGGAAATCGACGGCTCGCGGCTGGCTGCACCGGGGTGAA 3100
 GCGGACGACCGGGCAGCATCCGGGCGGCATCATCGTCGTCCCGGATTATA
 TGGAAATTTACGATTTTACGCCGATTCAATATCCGGCCGATGACACGTCC 3200
 TCTGAATGGCGGACGACCCATTTGACTTCCATTTCGATCCACGACAATTT
 GTTGAAGCTCGATATTCTCGGGCACGACGATCCGACGGTCATTTCGCATGC 3300
 TGCAAGATTTAAGCGGCATCGATCCGAAAACGATCCCGACCGACGACCCG
 GATGTGATGGGCATTTTCAGCAGCACCGAGCCGCTTGGCGTTACGCCGGA 3400
 GCAAATCATGTGCAATGTCGGCACGATCGGCATTCCGGAGTTTGGCACGC
 GCTTCGTTTCGGCAAATGTTGGAAGAGACAAGGCCAAAAACGTTTTCCGAA 3500
 CTCGTGCAAATTTCCGGCTTGTGCGACGGCACCGATGTGTGGCTCGGCAA
 CGCGCAAGAGCTCATTCAAACGGCACGTGTACGTTATCGGAAGTCATCG 3600
 GCTGCCGCGACGACATTATGGTCTATTTGATTTACCGCGGGCTCGAGCCG
 TCGCTCGCTTTTAAATCATGGAATCCGTGCGCAAAGGAAAGGCTTAAC 3700
 GCCGGAGTTTGAAGCAGAAATGCGCAAACATGACGTGCCGGAGTGGTACA
 TCGATTCATGCAAAAAAATCAAGTACATGTTCCCGAAAGCGCACGCCGCC 3800
 GCCTACGTGTTAATGGCGGTGCGCATCGCCTACTTTAAGGTGCACCATCC
 GCTTTTGTATTACGCGTCGTACTTTACGGTGCGGGCGGAGGACTTTGACC 3900
 TTGACGCCATGATCAAAGGATCACCCGCCATTTCGCAAGCGGATTGAGGAA
 ATCAACGCCAAAGGCATTCAGGCGACGGCGAAAGAAAAAGCTTGCTCAC 4000
 GGTTCCTTGAGGTGGCCTTAGAGATGTGCGAGCGCGGCTTTTCCTTTAAAA 4100
 ATATCGATTTGTACCGCTCGCAGGCGACGGAATTCGTCATTGACGGCAAT
 TCTCTCATTCCGCCGTTCAACGCCATTCCGGGGCTTGGGACGAACGTGGC 4200
 GCAGGCGATCGTGCGCGCCCGCGAGGAAGGCGAGTTTTTGTGCAAGGAGG
 ATTTGCAACAGCGCGGCAAATTGTGCAAAACGCTGCTCGAGTATCTAGAA 4300
 AGCCGCGGCTGCCTTGACTCGCTTCCAGACCATAACCAGCTGTCGCTGTT

T

FIG. 88B

MVTKEQKERFLILLEQLKMTSDEWMPHFREAAIRKVVIDKEEKSWHFFYFQ	
FDNVLPVHVYKTFADRLQTAFRHIAAVRHTMEVEAPRVTEADVQAYWPLC	100
LAELQEGMSPLVDWLSRQTPELKGNKLLVVARHEAEALAIKRRFAKKIAD	
VYASFGFPPLQLDVSVEPSKQEMEQFLAQKQQEDEERALAVLTDLAREEE	200
KAASAPPSGPLVIGYPIRDEEPVRRLETIVEEERRVVVQGYVFD AEVSEL	
KSGRTLTLTKITDYTNSILVKMFSRDKEDAEMSGVKKGMWVKVRGSVQN	300
DTFVRDLVIIANDLNEIAANERQDTAPEGEKRVELHLHTPMSQMDAVTSV	
TKLIEQAKKWGHPAIAVTDHAVVQSFPPEAYSAAKKHGMKVIYGLEANIVD	400
DGVPIAYNETHRRLSEETYVVFVDTTGLSAVYNTIIELAAVKVKDGEII	
DRFMSFANPGHPLSVTTMELTGITDEMVKDAPKPDDEVLARFVDWAGDATL	500
VAHNASFDIGFLNAGLARMGRGKIANPVIDTLELARFLYPDLKNHRLNTL	
CKKFDIELTQHHRAIYDAEATGHLLMRLKKEAEERGILFHDELNSRTHSE	600
ASYRLARPFHVTLLAQNETGLKNLFKLVSLSHIQYFHRVPRI PRSVLVKH	
RDGLLVGSGCDKGELFDNLIQKAPEEVEDIARFYDFLEVHPPDVYKPLIE	700
MDYVKDEEMIKNIIRSIVALGEKLDIPVVATGNVHYLNPEDKIYRKILIH	
SQGGANPLNRHELDPVYFRTTNEMLDCFSFLGPEKAKEIVDNTQKIASL	800
IGDVKPIKDELYTPRIEGADEETREMSYRRAKEIYGDPLPKLVEERLEKE	
LKSIIGHGFAVIYLISHKLVKKSLLDDGYLVGSRGSGVSSFVATMTEITEV	900
NPLPPHYVCPNCKHSEFFNDGSGVSGFDLPDKNCPRCGTYKKDGHDI PF	
ETFLGFGKGDKVPDIDLNFSGEYQPRAHNYTKVLFGEDNVYRAGTIGTVAD	1000
KTAYGFVKAYASDHNLELRGAEIDLAAGCTGVKRTTGQHPGGIIVVPDYM	
EIYDFTPIQYPADDTSSSEWRTHFDHFSIHDNLLKLDILGHDDPTVIRML	1100
QDLSGIDPKTIPTDDPDVMGIFSSTEPLGVTPEQIMCNVGTIGIPEFGTR	
FVRQMLEETRPKTFSELVQISGLSHGTDVWLGN AQELIQNGTCTLSEVIG	1200
CRDDIMVYLIYRGLEPSLAFKIMESVRKGKGLTPEFEAEMRKHDVPEWYI	
DSCKKIKYMFPAKAAAYVLM AVRIAYFKVHHPLLYASYFTVRAEDFDL	1300
DAMIKGSPAIRKRIEEINAKGIQATAKEKSLLTVLEVALEM CERGFSFKN	
IDLYRSQATEFVIDGNSLIPPFNAIPGLGTNVAQAIVRAREEGEFLSKED	1400
LQQRGKLSKTLLEYLESRGCLDSL PDHNQLSLF	

FIG. 89